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ENCYCLOPÆDIA
OF GENERAL INFORMATION

NAWAB SALAR JUNG SAHADUR.

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INDIA—MORISON

SPECIAL EDITION

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CASSELL'S ENCYCLOPÆDIA

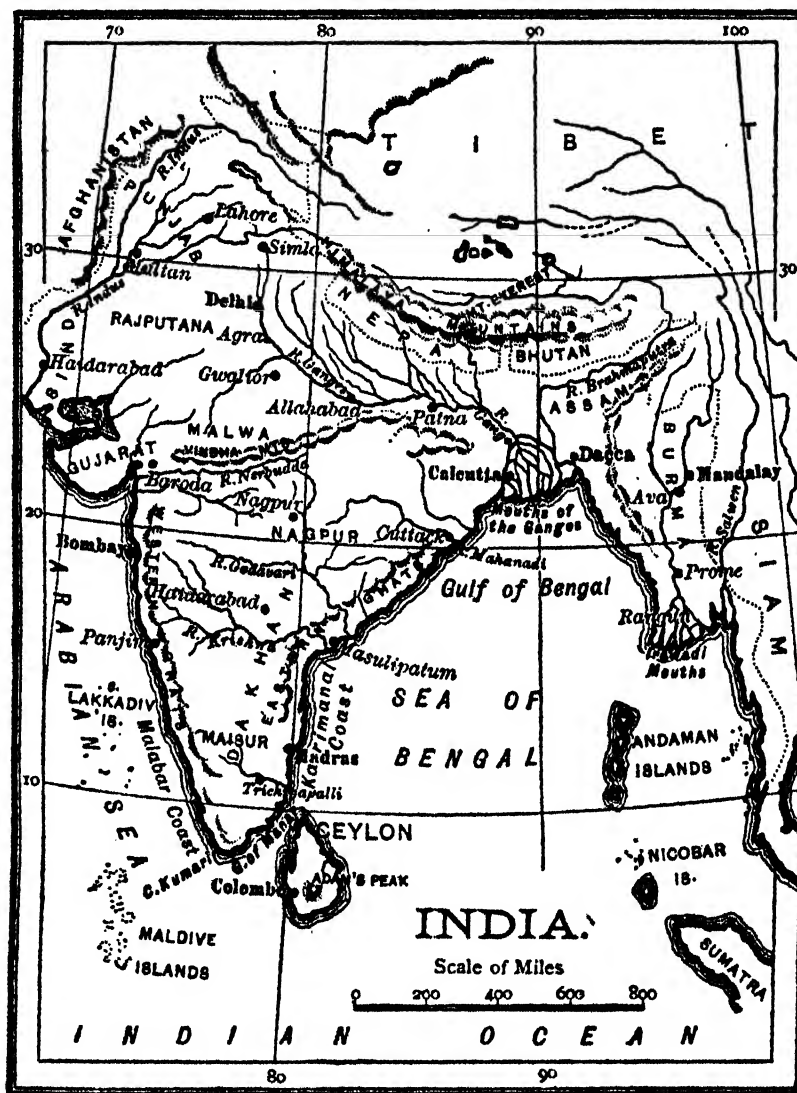
India. *Geography.* India, says an old writer, is properly called that great province of Asia in which great Alexander kept his warres, and which was so named of the river Indus." From this its original application to the country on the banks of the Indus, the name spread to the whole plain between and including the valleys of the Indus and Ganges, and in a vaguer sense to all the regions beyond. Ptolemy distinguished India "intra Gangem" from India "extra Gangem," and later we find *India major*, meaning probably northern India, that is, the Indo-Gangetic plain or Hindustan proper, and *India minor*, the peninsula and tableland which projects due south into the Indian Ocean, and narrows to a point at Cape Comorin over against the island of Ceylon. The etymology of the word is simple. The Sanskrit name of the great river which impressed the imagination of invaders from the north-west was *Sindhu*. This became *Hindu* in the Persian, and so passed into the Greek forms *Ἰνδοί* (the people), *Ἰνδός* (the river), and *Ἰνδική* (the country on the banks of the river), which are first met with in a fragment of Hecataeus of Miletus about 500 B.C., and in Herodotus. For many centuries, however, the conception of India was vague, and its twofold signification gave rise to the plural form of "the Indies," which became later the "East Indies," in contra-distinction to the "West Indies," and survives in "les Indes." To European nations who have possessions in the East the term "India" expresses the extent of their possessions. Thus the Portuguese have a Governor-General of India, meaning Goa and its small dependencies Daman and Diu. Spaniards and Dutch, in speaking of India, mean their respective island possessions in the Eastern Archipelago. To an Englishman the name expresses not only India proper as understood by the world at large—that is, the whole of the great province of Asia comprising three well-defined regions: (1) the southern slopes of the long line of the Himalayas and connected ranges, (2) the broad belt of alluvial plain which lies at the foot of the mountains, and extends across the country from sea to sea, a distance of 1,700 miles, (3) the tableland, which with a margin of alluvial coast forms the rest of the peninsula—it includes also Burma, which, as part of "further India" or the Indo-Chinese peninsula, appears on the map as a pendent of the peninsula fringing the Eastern waters of the Bay of Bengal. Thus we arrive at "British India,"

an Empire which in extent is larger than the Continent of Europe without Russia, and supports one-fifth of the population of the world. It is about 2,000 miles from the southernmost point of Cape Comorin to the Hindu Kush, the extension of the Himalaya range which bounds the northern dependencies of the feudatory state of Kashmir, and separates the river systems of the Indus and the Oxus. The distance is about the same from the Mekong river, where it touches the dependencies of Burma, to the Suleiman range which separates Sind from Baluchistan. The latter country has a British Political Agent, whose influence is extensive though undefined, and British Baluchistan may be classed as a native state. But if Baluchistan be excluded the frontier extends 6,580 miles by sea and about 5,000 miles by land, from the mouth of the little river Hab, 20 miles west of Karachi, to the southernmost point of Tenasserim east of the Bay of Bengal. It is noticeable that in all this length of coast there are so few good harbours; on the eastern side of the peninsula practically none. On the land frontier in like manner the practicable passes through the mountains are few. The Khaibar pass from Northern and the Bolan from Southern Afghanistan have been crossed by invading armies. Across the Hindu Kush the most practicable passes are the Dorah, the Baroghil, and the Balkra from the Oxus valley, and the Karakoram from Chinese Turkestan.

The most striking feature of Peninsular India is the range of the Western Ghats, which forms a great wall close to the western coast, and stretches from the Gulf of Cambay to the far south, with a gap at Beypore. This range, averaging a height of 3,000 feet and rising in the Nilgiris to 8,760 feet, faces the south-western monsoon, and consequently draws down on its western slopes a large portion of the moisture which the monsoon winds bring from the ocean. East of the range the rainfall is relatively light. The watershed of the peninsula being so close to the western coast, the streams draining into the Arabian Sea are insignificant, until we reach the Gulf of Cambay. Here the rivers Tapti and Nerbada, which drain the northern portion of the peninsula, have their outflow north of the Western Ghats range. The other important rivers of the peninsula, Mahanadi, Godavari, Kistna or Krishna, and Kaveri, flow eastwards, and form large and fertile deltas. The peninsula forms

a huge tableland sloping gradually eastwards from the Western Ghats. What are called the Eastern Ghats may be described as the eastern scarp of this tableland. The northern edge of the plateau is marked by the Vindhya and Satpura ranges stretching east from the bay of Cambay to the highlands of the Central Provinces, from which other hill ranges extend into Bengal. Till British enterprise opened up the country by roads and railways the Vindhya and Satpura hills and their

Gondwana series of rocks, which are entirely of fresh-water origin, and are not only of geological interest but also of economic value, as they contain the chief coalfields of India. The only other rock of peninsular India which need be mentioned is the Dakhan trap, a basaltic rock covering over 200,000 square miles of area, and furnishing the rich black cotton soil of the Dakhan. The great volcanic outbursts which produced this trap commenced in the cretaceous period and lasted into Eocene times.



MAP OF INDIA.

continuations to Bengal shut off Hindustan from the Dakhan or Southern India and hindered the political consolidation of the country.

Geology. In this great tableland of peninsular India the oldest rocks consist of gneiss, found in three tracts—in Bundelkhand, where they are oldest of all, among the Aravalli ranges which flank the Rajputana desert on the south-east, and through a large part of Bengal and Madras extending to Ceylon. Next in antiquity are the Transition rocks; then the Vindhyan rocks, which are of sandstone of very early Palæozoic formation, but containing no fossils as yet discovered. Between the Narbada and the Son, a tributary of the Ganges on the north and the Kistna on the south, lie the

The second division of India, the Indo-Gangetic plain, is of recent geological formation, much of it a very late gift of the Indus and Ganges rivers. The watershed between these two river systems is at its lowest point only 924 feet above the sea; thence the plain slopes gently for 1,050 miles in one direction to the Bay of Bengal, and 850 miles in the other to the Arabian Sea. This region, which has an area of 300,000 square miles, is the most populous and fertile part of India. On the west, however, it includes the comparatively rainless and waterless deserts of Sind and Rajputana. At its eastern extremity the rainfall is of the heaviest. The meteorological station which has recorded the largest rainfall in the world—481 inches of rain in



PHYSICAL MAP OF INDIA.

an average year and 805 inches in one exceptionally rainy year — is Chara Punji in Assam at the eastern corner of the Indo-Gangetic plain. The south-western monsoon, laden with moisture, breaks on the Assam hills and the southern slopes of the Himalayas with even greater force than on the Western Ghats. Blocked to the northward by the towering Himalayas the monsoon current is turned westwards up the Ganges valley, and delivers its moisture in decreasing showers as it moves towards the Punjab. The whole of the enormous rainfall on the Himalayas finds its way to the sea by the Ganges or Indus. The Indus, the Sutlej, and the Sanpo or Brahmaputra rise close together on the northern Himalayas, and the Jumna, Ganges, and Gogra at no very distant points in the range. The other rivers find their way by courses more or less direct to the plains of Hindustan, but the Indus turning north-west has to work its course round the north of Kashmir before it finds an opening southwards to enter the Punjab, and the Sanpo flows east through the whole length of Tibet before it finds the gorge of the Dihong through which to pour its waters by the Brahmaputra channel into the Bay of Bengal.

Embraced by these two rivers, the third or Himalayan region, which for 1,500 miles shuts off India from the rest of Asia, lies in great part beyond the political frontiers of India. Its geology in consequence is imperfectly known. This range, which is rightly termed Himalaya or the abode of snow, is seldom lower than 18,000 feet, and contains the highest peaks in the world, Kinchanganja, 28,176 feet, and Gaurisankar or Everest, 29,000 feet. Stretching from east to west with an increasingly northern inclination till it loses itself in the knot of highlands called the Pamirs, it forms the southern rampart of the barren plateau of Tibet, which is itself generally 15,000 feet above the level of the sea.

The elevation of the Himalayan region and the depression of the Indo-Gangetic plain were probably contemporaneous. The great disturbance which produced them is believed to have taken place after the deposition of the Eocene beds. The Northern Himalayan or Ladakh range consists of old gneissic rocks. In the central region there are two gneissic axes separated by a trough or synclinal valley containing fossiliferous beds. South of this true Himalayan range, to the east of the Sutlej gorge, is the Lower Himalaya tract, in which the beds are greatly disturbed, sometimes even inverted over large areas. Yet farther south is the sub-Himalayan range, composed of later tertiary rocks (Siwaliks, etc.). The salt range in the north-west of the Punjab has a special geological interest because it contains, without evidence of any important break in succession, representatives of the great European formations of Silurian and later epochs.

The Hindu Kush, which forms the north-western boundary of the empire, is a continuation of the Himalayas. Southwards from this extremity of the Himalayan range stretch mountainous offshoots which reach almost to the sea, the most important line being known under the names of Safed Koh,

Suleiman, and Hala mountains. The rainfall on these southern ranges is relatively scanty. From the eastern extremity of the Himalayas also stretch southern offshoots which form the Naga and Patkoi hills of Assam and the Yomas of Burma. These hill ranges with the intervening alluvial valleys of the Irawadi, Sittang, and Salween form the fourth region of the Indian Empire. The rainfall near the coast here in Bengal is excessive, but rapidly diminishes farther inland.

Flora. India has no distinctive botanical features peculiar to itself. Its vegetation is of a composite character, including the flora of Persia and the south-eastern Mediterranean area to the north-west, of Siberia to the north, of China to the east, and of Malay to the south-east. The Himalayas present a great variety of flora, varying from that of the Malayan type, which luxuriates in the hot humid belt at the base, to the temperate and even arctic flora at higher altitudes. Eastwards this flora approximates to the Chinese, westwards to the Mediterranean type, the tea-tree being found at the one extremity, the holm oak and the hawthorn at the other. Pines are common from one end of these mountains to the other. The deodar, which is allied to the cedar of Lebanon, is perhaps the most conspicuous. The dry country of the north-western area in Sind, Punjab, and Rajputana is characterised by low scattered jungle of thorn and tamarisk. Contrasted with this is the Malayan vegetation in the humid regions of India, such as Assam and Burma and the bases of the Eastern Himalayas, and on the Malabar Coast. In this region are to be found rubber-yielding trees and teak forests. Midway between these types comes the flora of Western India with its regions of moderate rainfall. Here the forests, besides containing teak, produce tcon and sal trees which are valuable for their timber. Satin-wood and sandal-wood are also found in this region.

Fauna. The wild animals of India include the lion, which is now only found in the sandy deserts of Gujarat, the tiger and the panther, which throughout India are very destructive of cattle and human life, wolves with their kin the jackals and wild dogs of various species, bears of which the common black or sloth kind is found throughout India; the elephant, which has been exterminated in many districts, and is now protected under a Government monopoly; the rhinoceros, of which there are four varieties; the wild hog, the animal which affords the exciting sport of "pig-sticking"; the wild ass, which exists, but is hard to approach, in the deserts of Sind and Kutch; wild sheep and goats, including the *ovis ammon*, and *ovis poli* of Tibet; antelopes and deer of various species; the bison, which is one of the most dangerous of big game, with rats and reptiles of many disagreeable kinds. Much trouble is taken and expense incurred by Government for the destruction of dangerous wild animals and snakes. This is justified by the fact that in one year 24,300 persons and 70,816 cattle have been killed by wild animals and snakes. Among birds the parrot tribe are the most remarkable for beauty. Fish swarm in the Indian rivers, the carp tribe predominating. The Gangetic

dolphin, 6 to 12 feet long, is found hundreds of miles up the Ganges and Indus. The mahsir, a species of barbel, is the finest of Indian fish from the angler's point of view. Insects are innumerable.

The following table shows the population of the British Empire in India, divided into provinces and native states, or groups of native states, according to the returns of the census of 1901 :—

Gangetic plain carries a rural population at a rate of 400 to 800 to the square mile. Indeed, in large tracts of Bengal two persons have to live on the proceeds of each cultivated acre. On the other hand, the Central Provinces, Burma, Assam, Rajputana, and parts of the Punjab, have a population of less than 150 to the square mile. The rainfall ranges from 100 inches to less than 10. The tenures

Provinces, etc., under the Administration of:	Area in Square Miles.	Number of Occupied Houses.	Population in 1901.	Increase per cent. since 1891	No. per Square Mile.
The Governor-General of India—					
Ajmere and Merwara	2,711	107,401	476,912	- 12·07	175
Berar	17,710	567,910	2,754,016	- 4·95	155
Coorg	1,582	30,560	180,607	+ 4·36	114
Andaman Islands and Nicobars	3,143	2,550	24,649	—	7
Baluchistan	45,804	68,508	308,246	—	6
Governors—					
Madras	141,726	7,127,014	38,209,436	+ 7·74	269
Bombay (including Sind and Aden)	123,064	3,490,715	18,559,561	- 1·70	150
Lieutenant-Governors—					
Bengal (Since 1905 (1) Bengal and (2) Eastern Bengal [and Assam])	151,185	14,329,110	74,744,866	+ 4·76	494
North-West Frontier Province	16,466	350,895	2,125,480	—	129
United Provinces of Agra and Oudh	107,164	8,684,860	47,691,782	+ 1·68	445
Punjab	97,209	3,212,734	20,330,339	+ 7·61	208
Chief Commissioners—					
Assam (see Bengal note)	56,243	1,309,190	6,126,343	+ 11·85	108
Burma	236,738	2,092,811	10,490,624	—	44
Central Provinces	86,459	2,069,817	9,876,646	- 8·42	114
Total British India	1,087,204	43,444,070	231,899,507	+ 4·82	213
NATIVE STATES.					
Under the Government of India—					
Haidarabad	82,698	2,283,447	11,141,142	- 3·43	134
Baroda	8,099	489,955	1,952,692	- 19·16	241
Mysore	20,444	1,110,687	5,539,399	+ 12·06	188
Kashmir	80,900	464,685	2,905,578	+ 14·22	35
Rajputana Agency	127,541	1,911,483	9,723,301	- 18·91	76
Central Indian Agency	78,772	1,697,850	8,628,781	- 16·38	109
Bombay	65,761	1,513,380	6,908,648	- 14·50	105
Madras	9,969	807,732	4,188,086	+ 12·17	420
Bengal	38,652	706,579	3,748,544	+ 12·67	96
Central Provinces	29,485	369,034	1,996,383	- 7·60	67
North-West Provinces	5,079	150,089	802,097	+ 1·21	157
Punjab	86,532	762,557	4,424,398	+ 3·78	121
Baluchistan Agency	86,511	109,817	502,500	—	5
[The independent states of Baluchistan (native area), Bhutan, Nepal, and Sikkim, are dealt with under their respective headings.]					
Total Native States ...	679,393	12,397,245	62,461,549	- 5·47	134
Grand Total India ...	1,766,597	55,841,315	294,361,056	+ 2·45	173

Note.—To these figures may also be added :—

	Area in Sq. Miles.	Population.	No. per Sq. Mile.
Portuguese Settlements ...	1,605	561,384	349
French Settlements ...	208	282,923	1,393

The circumstances and condition of the people vary greatly in different parts of India. The lower

and the distribution of profits from land vary greatly. With early marriages almost universal, the population increases yearly at a rate varying from $\frac{1}{2}$ per cent. per annum in the Upper Gangetic plain to 4 per cent. per annum in Burma. There is no poor law or system of poor relief, except in famine times, but there is everywhere a widespread and open-handed charity. In the overcrowded districts, like North Behar, and where, as in parts of the Dakhan, the soil is very poor, the condition of the landless labourers is deplorably low; but in most years and in most districts the position of the peasantry is

fairly prosperous, and, so far as the ordinary tests can be applied, is steadily improving. There is an appreciable emigration from the crowded districts to Assam and Burma, as well as to Ceylon, the Straits Settlements, to various colonies in the West Indies, and elsewhere.

The population, divided according to religions, shows a total of 207,146,026 Hindus, 62,458,077 Muhammadans, 9,476,759 Buddhists, almost all in Burma, and 2,923,241 Christians, of which the largest section is Roman Catholic. Education has been extended to but a small, though increasing, portion of the people, there being only 12,097,530 persons who can read and write, and 3,195,220 under instruction, out of a total population of over 290,000,000. There are five universities in India, those of Calcutta, Madras, and Bombay, the Punjab University, established at Lahore, and one at Allahabad for the United Provinces. These are modelled on the fashion of the London University, and their examinations determine the curricula of the higher schools. Under British rule a vernacular press and literature have arisen.

Christianity in India, if the traditions of Southern India are to be believed, was founded by the Apostle St. Thomas, who met his death as a martyr near Madras in A.D. 68. A revival of the faith is also said to have been caused by the mission of several bishops from Babylon at the close of the 5th century. The 250,000 Syrian (Nestorian) Christians now in India still testify to the work of those early missionaries. The Portuguese combined conquest and conversion. With the arrival of St. Francis Xavier in 1542 began the well-directed and successful labours of the Jesuit missions in Southern India. For a time it seemed not unlikely that Christianity under their teaching would be established throughout a large part of Northern India as well, but with the decline of the Portuguese power and the suppression by Portugal of the Society of Jesus in 1759 the cause languished. Since, however, the re-establishment of the order in 1814 its missions have made great progress, and the Roman Catholics in India continue to increase.

The pioneers of Protestantism were Lutherans, whose missions at Tranquebar date from 1705. The Baptists under Carey began their work at Serampore in 1793, and were followed by the London Missionary Society in 1813. The opposition of the East India Company to Protestant missionary effort was withdrawn in that year. A bishopric of Calcutta was established in the following year, and from that time the Church of England has kept up a missionary connection with India, supplemented since 1830 by the missions of numerous societies European and American.

The Christian population for all India was in 1901 given as 2,923,241 (of which 2,664,313 were natives) or 46 per cent. increase in 20 years. The principal groups were: Protestants, 1,041,734 (453,612 being Anglicans); Roman Catholics, 1,202,189; Syrian Church, 248,741. The increase per cent. since 1891 was 43 for Protestants, and 30.8 for Christian religions as a whole.

History. Ancient India: The first precise date in Indian history is that of Alexander's invasion (327

B.C.). The general progress of Indian civilisation, however, before this date, can be learnt from the ancient Sanskrit literature of India, of which the earliest portions are the *Vedas*. The oldest of these, the *Rig Veda*, is a kind of hymnal, composed, it is guessed, about 1400 B.C. There are four other *Vedas* of later date and less sanctity. As commentaries and additions to the *Vedas* were written the Brahmanas, Sutras, Upanishads, and Puranas, which are chiefly treatises on theology and ceremonial. In other treatises of Brahmanical literature astronomy, music, and medicine are dealt with in an original way; but more important are the legal maxims, collected into the so-called *Code of Manu* about 500 B.C. Besides these books there are two great Sanskrit epics, the *Mahabharata* and the *Ramayana*, and a Sanskrit drama of which the best known writer was Kalidasa, who flourished in the last century before Christ. Early Buddhism has also recorded itself in certain writings, which were collected in three volumes (*tripitaka*), and edited in the fifth century before Christ.

Sanskrit, the language of all this literature, is clearly and closely allied to the principal languages of Europe. The Aryans, who spoke it, originally worshipped the sky, sun, fire, water, and other natural powers under various names; sometimes, however, grasping at the unity of the Godhead under a multiplicity of manifestations. In their earliest poems these people appear to the north-west of India, about to cross the Indus, and as they proceed they drive before them the "black-skinned" natives of pre-Aryan India. It was probably centuries before the Aryans fully occupied the whole of the Gangetic plain. At the first they are not priestridden or divided into castes; but at an early date four castes are found to be established: first, the priests, or Brahmins, the twice-born; secondly, the fighting caste, the Rajputs or Kshatriyas; then the Vaisyas or Aryan agricultural settlers; and lastly, the Sudras, who are the aboriginal or mixed populations reduced to serfdom. Originating in this classification, the castes of India are now multiplied indefinitely, with cross divisions of race, place, and occupation. All society is organised on a system of caste, which forbids members of different castes to intermarry or eat together, prescribes and proscribes articles of food, and confines families to particular occupations. Rules for preserving caste distinctions are most dogmatically laid down in the *Code of Manu*.

About B.C. 543 there rose a great reformer to protest against the exclusiveness and tyranny of caste and of the Brahman priesthood. Gautama Buddha succeeded by a long life of teaching and of simple goodness in establishing a new religion, which insisted on the common brotherhood of men without distinctions of caste. His creed, which recognised no God, was gradually adopted throughout India, and by the efforts of its missionaries was extended to Ceylon, Tibet, China, and the Indo-Chinese peninsula. It found its Constantine the Great in the great king Asoka, who was converted in B.C. 257, and established Buddhism as the State religion of his kingdom of Magadha or Behar. Nevertheless Buddhism never ejected Brahmanism from India. The two existed side by side till about the tenth

century (A.D.), by which time the latter had gradually renewed its strength, and in its modified form of Hinduism finally displaced Buddhism as a popular faith in India itself. In Ceylon and Burma Buddhism still lives, but in India the kindred sect of the Jains is its only representative.

The grandfather of Asoka was Chandragupta, the Greek Sandracottus, whose court and country are described by Megasthenes. Alexander the Great, in overthrowing the Persian Empire, had carried his arms into its most eastern provinces of Punjab and Sind. By the reluctance of his troops to advance farther east, he had been compelled to forego the conquest of Hindustan; and, dying shortly afterwards, he left the eastern portion of his new empire to Seleucus Nicator, who, consolidating his power in Syria, parted with his outlying dependencies of Cabul and the Punjab to the Indian potentate, Chandragupta, and stationed an ambassador at his court. This ambassador, Megasthenes, in describing the country, notices the absence of slavery in India, the chastity of the women, and the courage of the men. He speaks of their honesty and absolute truthfulness, and mentions that they never resorted to litigation. He divides India into 118 kingdoms, some with suzerain rights; and he describes the village communities of India as not unlike independent Greek republics.

A succession of inroads of Scythian or Tartar tribes between 130 B.C. and 500 A.D. swept away the remnants of Greek settlements and Greek influence in Bactria and India, and established a Scythic monarchy in Hindustan. Their kings were converted to Buddhism and aided its diffusion; and, when Buddhism gave way finally to Hinduism, the Scythic element no doubt had its effect on the social and religious development of the new creed, depriving it of its old exclusiveness, and adapting it to receive within its folds and under its limitations the multitudinous gods and cults of neighbouring non-Aryan tribes.

Muhammadan India. Another religion was brought into India by the next series of invaders. These were the Muhammadan conquerors (Turkis, Afghans, and Moghuls), who poured into India in successive waves between the years of 714 and 1526 A.D. Their earliest attempts to establish a Muhammadan rule in India were not successful. Not till the time of Mahmud of Ghazni (1001-30) was a Muhammadan power established east of the Khyber Pass. Delhi was taken in 1206 by Kutab-uddin, who founded a dynasty, ruling over the greater part of Hindustan; and the Khilji dynasty (1290-1320) extended the Muhammadan power to southern India. Muhammad Tugluk, who belonged to the next Muhammadan line, has left a name which is a by-word of ferocity and cruel oppression. This dynasty was terminated by the invasion of the hordes of Tamerlane (Timur) in 1398. Altogether there were eight dynasties from that of Ghazni to the Moghul line founded by Baber, a descendant of Genghis Khan and of Timur, in 1526.

At the date of Baber's invasion there was an Afghan king ruling in Hindustan, and five independent Muhammadan States in the Dakhan—viz. Bijapur, Golconda, Ahmednagar, Berar, and Bidar

—besides a Hindu raja still holding sway at Vijayanagar in the far south. The Afghan house of Lodi was overthrown by Baber on the fateful field of Panipat. Baber's son, Humayun (1530-56), for a time lost the sovereignty won by his father, but recovered it in another battle at Panipat shortly before his death. He was succeeded by his son, Akbar the Great (1556-1605), who was the real founder and organiser of the Moghul Empire. Partly by force, partly by conciliation, he reduced the Muhammadan States of Hindustan and the Rajput princes under his sway, tolerating the Hindu religion and providing a career for the Rajput nobility. With the help of Raja Todar Mall, his minister of land revenue, and Abul Fazl, his minister of finance, who was also his historian, he reformed the whole public administration, as well in matters of revenue as of justice and police. He settled the land revenue of northern India according to Hindu customs, obtaining £17,500,000 sterling from this source, his whole income being estimated at £42,000,000 sterling. Akbar's son and successor was Jehangir (1605-28), whose Court was visited by Sir Thomas Roe, the first British ambassador to India. He was succeeded by his son Shah Jehan (1628-58), the builder of the most magnificent buildings in India, including the exquisite mausoleum of the Taj Mahal at Agra and the Great Mosque, or Jama Masjid, at Delhi. Before his death Shah Jehan had been superseded by his crafty, fanatical, and usurping son Aurungzeb (1658-1707), whose long reign saw the decline of the power of the Moghul Empire. Its strength was wasted in prolonged campaigns for the conquest of the independent kingdoms of the Dakhan and in vain efforts to check the growing power of the Mahrattas. After Aurungzeb's death the Moghul Empire was rapidly disintegrated. In 1738 Nadir Shah of Persia invaded India and sacked Delhi, slaying 100,000 of its inhabitants and carrying off, it is said, £50,000,000 sterling worth of treasure. By this time the Dakhan, Oudh, and Bengal had become practically independent, the former under the Nizam-ul-Mulk, the founder of the present house of Haidarabad.

The Mahrattas. It then seemed that the predominant position in India was to pass to the Mahrattas, whose power had been founded by Sivaji (1627-80), but was now led by the Peshwa, the prime minister who acted the part of mayor of the palace to Sivaji's successors at Poona. The Mahratta confederacy consisted of five chiefs, of which three are still represented by the Gaekwar in Baroda, Scindia in Gwalior, and Holkar in Indore, the other two—the Peshwa at Poona and the Bhonsla Raja at Nagpore—having been absorbed in the British dominion. The combined forces of these five powers, however, met with a crushing reverse at Panipat (1761) at the hands of the Muhammadans, under the Afghan Ahmad Shah Durani, from which they never recovered. It was a blessing to the country that the Mahrattas, and their successors the Pindaris, were finally subjugated by the British, as their system, if it may be so called, was one of organised plunder rather than of settled government.

European Rivalry. From time immemorial the most lucrative branch of the world's commerce has been that between Europe and India and the farther East. Centring in the Middle Ages at Constantinople, it was the mainstay of the Byzantine power. With the decadence of that Empire this trade passed to the Italian cities, and Venice then, it has been pointed out, literally "held the gorgeous East in fee." At the close of the 15th century the desire to share in this lucrative commerce began to lead the western nations of Europe to seek a route to India by the ocean. It was in an attempt to seek India in 1492 that Columbus discovered America for Spain; and five years later Vasco de Gama, who carried the Portuguese flag, succeeded in doubling the Cape of Good Hope and in reaching Calicut in 1498. Notwithstanding the hostility of the Arabs, who then monopolised the trade on the Indian coast, and of the Turks, who sought to retain the Indian commerce in its existing channels through Egypt and Asia, the Portuguese in a few years made themselves supreme in the Eastern seas, and enjoyed the commercial profits of their supremacy for a century. Their Eastern trade was a royal enterprise and monopoly, and with it they sought to combine the conquest and conversion of the country. But for this task their power was inadequate, though for a period, especially during the governorship of Albuquerque, their influence in India itself was considerable. All the possessions in India that now remain to Portugal are Goa, which was occupied in 1510, and Daman and Diu, with a total population of 561,384 persons. The Portuguese monopoly in the East was broken through, not without a struggle, by the Dutch and English at the beginning of the 17th century. From 1600 to 1700, though the English were eager rivals and the French made fitful attempts to share in the trade and conquests of the East Indies, the supremacy was held by the Dutch. In the Eastern Archipelago, where their principal establishments were located and their territorial conquests made, they succeeded in ejecting all their rivals. Of their possessions Java alone still remains to them, having been taken by England in 1810, but restored in 1814. After the decline of the power of Holland early in the 18th century, there remained only two formidable European competitors in the race for Indian commerce and Indian empire. These were the English and the French. The first English East India Company was incorporated on the 31st December, 1600. Two or three other companies were started at later dates, but the last of the rival companies was amalgamated with the original company in 1709. The early doings of the English East India Company include their successful sea-fight against the Portuguese off Swally, the port of Surat, in 1615; their expulsion from the Eastern Archipelago by the Dutch in 1624, the massacre of Amboyna having occurred in the previous year; the foundation of their settlement at Madras in 1639 and at Hugli in 1640. Surat had been founded at an earlier date, but the seat of the Western Presidency was in 1687 transferred from it to the island of Bombay, which had been ceded to England by Portugal in 1661 and was delivered to

the company four years later. As a Presidency settlement Hugli also gave place in 1688 to Calcutta, which is 24 miles lower down the same river.

The earlier French East India Companies, though partially successful in occupying the Mauritius and planting settlements in Madagascar, had failed to gain a footing on the continent of India. It was the fifth company, started by Colbert in 1664, which founded the settlements of Pondicherry in 1674 and Chandernagore in 1688. This was succeeded by a sixth company, established in 1719, which raised the French influence in India to its highest point and contested the Empire of India with the English. The failure of the French company in that contest was due to the want of steady support from home, to the absence of unanimity between their governors, commanders, and admirals, and to their inferiority in sea power. The contest was fought out between the years 1744 and 1761. The great French governor, Dupleix, was the first since the days of Portuguese ascendancy to deliberately conceive the project of establishing a European empire in India, and for a short period he succeeded in imposing French predominance upon the greater part of the peninsula. The incidents of the war between the French and English companies include the capture of Madras by the French in 1746; its surrender as one of the conditions of the treaty of Aix-la-Chapelle in 1748; the second outbreak of war in 1750, Clive's heroic defence of Arcot in the following year; the recall of Dupleix in 1756; the arrival of a large French force under Lally in 1759, his defeat in the following year by Colonel (Sir Eyre) Coote at Wandewash, and the capture of Pondicherry in 1761. As a shadow of their once predominant influence, the French still possess Pondicherry and one or two minor settlements, having a population of 287,402 souls (in 1901); but since 1761 they have not been a political power in India, though their intrigues with native chiefs have sometimes given trouble and anxiety to the British power.

Growth of the British Empire. During the progress of the contest between the two companies on the Coromandel coast the first step had been taken towards the acquisition of territorial dominion by the company in Bengal. In those days Bengal was nominally a province of the Moghul Empire. The last of its great Nawabs was Ali Vardi Khan, who died in 1756. He was succeeded by Siraj-ad-Daula (Surajah Dowlah), whose ungovernable temper led to a quarrel with the English company. He was responsible, after having captured Calcutta, for the tragedy of the Black Hole, in which so many of the English who had surrendered met with a cruel death. This took place in June, 1756. On receipt of the news at Madras, Olive and Admiral Watson repaired with a considerable force to Bengal, recovered Calcutta, and at the battle of Plassey (June 23, 1757) completely routed the Nawab's army. Though the immediate results of this battle were relatively small, its date is generally accepted as the date of the beginning of the British Empire in the East. When Clive, who had been Governor of Bengal from 1758 to 1760, left for England, disorder and corruption prevailed. Sums of money were exacted from the native rulers.

One Nawab, Mir Jafar, was replaced by another, Mir Kasim, who proved to be less complacent to the company than had been expected. A quarrel arose which led to the massacre of the English at Patna (1763) and to a war with both the Nawab of Bengal and the Nawab Wazir of Oudh. Major Munro's victory at Baxar (1764), however, broke down all opposition, and brought also the Moghul Emperor a suppliant to the English camp. Oudh was restored to the Nawab Wazir; Allahabad and Kora were given to the emperor, and the company received the *diwani* or fiscal administration of Bengal, Behar, and Orissa with the jurisdiction of the Circars. This was the beginning of the company's territorial dominion. Clive, who had returned to India for his second term as governor in time to effect this arrangement, also carried through, in the face of much opposition, the reorganisation and purification of the company's service. In 1772 Warren Hastings received the Governorship of Bengal. This office, the title of which was changed under the Regulating Act in 1774 to that of Governor-General, he held till 1785. During this long period of rule he brought the administration of the country under European officers, and created the administrative system on its existing lines. It was on his internal reforms, in regard to the collection of revenue and the courts of justice and police, that Warren Hastings prided himself. It is by his Rohilla War, and his treatment of the Raja of Benares and the Begum of Oudh that, thanks to the exaggerated declamations of orators and unfair judgments of historians, he is best remembered. Hampered in his domestic policy by the opposition of his own council, and forced to find remittances for his masters at home, he had to face the most serious combination of native powers ever opposed to the English in India, and to carry through distant and protracted wars for which his policy was not responsible. The Bombay Presidency, involved in a war with the Mahrattas in 1778, had to be saved from the consequences of their rash conduct by an army despatched from the other side of India, and with difficulty the *status quo ante* was re-established by a treaty with these enemies in 1782. It was during this period of stress that Haidar Ali, the Sultan of Mysore, burst unexpectedly as a thundercloud upon Madras, and the southern Presidency had also to be saved by another army marching from Bengal. Warren Hastings, who had thus preserved and even strengthened British dominion in India at a time when England was losing its colonies in America and barely holding its own upon the sea, was succeeded by Lord Cornwallis, the first peer and the first Parliamentary statesman who undertook the government of India. His first administration lasted from 1786 to 1793, and is remembered chiefly in connection with the second Mysore War (1790-92), and the permanent settlement of the land revenue in Bengal, which is described in a later paragraph. The Mysore War, in which Lord Cornwallis had the Nizam and the Mahrattas as allies, left Tipu Sultan, the son and successor of Haidar Ali, bereft of half his power and territory and full of resentment against the British power. Under Lord

Cornwallis criminal jurisdiction was for the first time entrusted to Europeans and a supreme court of criminal judicature established at Calcutta.

Lord Cornwallis was succeeded by Sir John Shore (Lord Teignmouth), who had been instrumental in elaborating the details of the permanent settlement, though not responsible for making them permanent. His rule (1793-98) was uneventful. He was followed by Lord Mornington (afterwards Marquess of Wellesley), who from 1798 to 1805 carried out a masterful policy. When he arrived in India, Napoleon was in Egypt, a correspondence was being conducted between the French and Tipu Sultan, and French adventurers officered and disciplined the armies of the Nizam and of Scindia. The Nizam's army was peaceably disbanded and replaced by troops under the command of British officers; the Mysore State was conquered and its usurping dynasty wiped out of existence by a campaign ending with the capture of Seringapatam and the death of Tipu Sultan (1799); the safety of Bengal to the north-west was secured by new financial and military arrangements with the loyal but decaying state of Oudh; the Madras Presidency was extended to almost its present limits by the annexation of the ill-governed territories of the Nawab of Arcot; in a series of brilliant campaigns the organised armies of Scindia were destroyed, and the Moghul Emperor at Delhi, who had long been a puppet in the hands of the Mahrattas, was by Lord Wellesley's measures brought into the custody of the British power, and as state pensioners of the English he and his successors continued till they came to a tragic termination in the days of the Sepoy Mutiny. His whole policy was directed to the establishment of British supremacy; and with that end in view he reduced and isolated the forces of the Native States, and bound the Chiefs to the British Government by a system of subsidiary alliances and of military contingents under British control. While free to exercise their proper internal authority, they were precluded from mutual aggression by the imposition of the supremacy and general protection of the British power.

Lord Wellesley's magnificent schemes exhausted the finances of the company, and alarmed the directors, who from the days of Clive had been averse to the extension of their dominions in the East. Lord Cornwallis was reappointed Governor-General (1805) to succeed Lord Wellesley, and to substitute for his schemes a policy of retrenchment and peace at any price. He died shortly afterwards, and his place was temporarily taken by the senior civil servant of the company, Sir George Barlow, till the arrival of the new Governor-General appointed in England, Lord Minto (1807-13). During this period the British Government sought to restrict its responsibilities and to withdraw from entanglements with the native powers. But, at the same time, the fears of French and Russian invasion led to the extension of Indian diplomacy to the Courts of the Punjab, Afghanistan, and Persia; and as incidents of the naval and colonial war against Napoleon the French were expelled from the Mauritius, and the Cape of Good Hope and Java were seized from the Dutch. Within India itself

the policy prevailed of reaction in foreign affairs and of consolidation in internal administration.

Lord Minto was succeeded (1814-23) by the Earl of Moira (Marquess of Hastings), who completed Lord Wellesley's schemes of conquest and carried into final effect his policy of establishing the supremacy of the British power in India. The policy of non-intervention had failed. The countries outside our pale were falling more and more into hopeless disorder and distress. According to all recognised Indian traditions, it was incumbent on the power which enjoyed the imperial position to perform the imperial obligations of imposing peace on the strong and protecting the weak. Lord Hastings' first measure was to stamp out the free-booting bands of the Pindaris, who were devastating almost every state in the centre of India. Having destroyed them, he settled the whole country by a series of permanent treaties of subordinate alliance with the various native chiefs. His campaign and treaties involved him in disputes with the Mahrattas, and the last Mahratta War ensued, which led to the annexation of the Peshwa's dominions to the presidency of Bombay. The only other event of importance in Lord Hastings' *régime* was the Nepal War (1814-15). The next Governor-General, Lord Amherst (1823-28), at a cost of £14,000,000 sterling and 20,000 lives, mostly victims to sickness, extracted from the King of Ava a treaty by which Burma gave up all claims to Assam and ceded the provinces of Arakan and Tenasserim. His successor was Lord William Bentinck (1828-35), whose rule was marked by reforms instead of wars. Besides restoring equilibrium to the finances, disordered by the Burmese War, he reformed the judicial administration, admitted educated natives more freely into the service of Government, fostered education, abolished the custom of *suttee* or widow-burning, and stamped out *thuggee*, a large and secret organisation for murder and robbery.

Freedom of the press in India was granted during the short temporary administration of Sir Charles (Lord) Metcalfe (1835-36), who was followed by Lord Auckland (1837-42), whose name is connected with the first Afghan War. Conceived as a measure to check the advance of Russia in Central Asia, it was undertaken, with the alliance of Ranjit Singh, ruler of the Punjab, to replace Shah Shujah on the Afghan throne. For two years success smiled on this daring adventure. Then came the catastrophe of the disastrous retreat of the British troops from Kabul in the winter of 1841-42. Kabul was indeed recaptured in the following autumn, but the attempt to retain Afghanistan was abandoned.

Before the close of the Afghan War Lord Auckland had been succeeded by Lord Ellenborough (1842-44), whose period of rule was signalised by the annexation of Sind after the defeat of the army of the Mirs by Sir Charles Napier. The abolition of slavery in British India was the result of a short law passed at this time. The next Governor-General, Sir Henry (Lord) Hardinge (1844-48), was brought into collision with the Sikhs. Ranjit Singh, the founder of the Sikh kingdom, had died in 1839, leaving no successor to maintain efficient control over his powerful army. This army was

beaten and driven back in four great battles, and peace, a short-lived one, was exacted at Lahore (1845).

The renewal of the contest with the Sikhs took place shortly after the arrival of the next, and perhaps the greatest, of the Indian Governors-General, Lord Dalhousie. During his term of office (1848-56) wars on the west and on the east added the Punjab and Lower Burma to British territory. In consequence of continued and irremediable misgovernment Oudh was formally annexed; and by the exercise of the right of lapse the territories of Berar, of Satara, of Tanjore, of Jhansi, and of other principalities, were absorbed into the British provinces. Lord Dalhousie's annexation policy was based on his firm conviction that British administration was better and more conducive to the happiness of the governed than native rule. Not satisfied with wars and annexations, Lord Dalhousie brought an ardour for reform into every branch of the administration. He founded the Public Works Department. He opened the Ganges Canal, still the largest of irrigation works, and not only inaugurated the railway system in India, but planned all its trunk lines. He promoted steam navigation with England *via* the Red Sea, and introduced cheap postage and the electric telegraph; but his greatest administrative achievement was the organised government which in so short a time he established, under a remarkable staff of officers, in the newly-annexed province of the Punjab.

All was peaceful when Lord Canning stepped into Lord Dalhousie's place in 1856; but his administration (1856-62) was shortly disturbed by the great Sepoy Mutiny, which broke out at Meerut on May 10th, 1857. Almost all the sepoy regiments of the Bengal army revolted, and most of the contingents maintained by the native states. Delhi was occupied by the mutineers, and Cawnpore surrendered to them, while the garrison at Lucknow with difficulty maintained their position till relieved by British reinforcements. The army by which Delhi was retaken was organised from the Punjab, which remained loyal under the strong rule of Sir John Lawrence and his coadjutors. Oudh and the North-West Provinces were reconquered by fresh troops marching from Calcutta under Sir Colin Campbell (Lord Clyde), and the mutineers in Central India were overthrown in a brilliant campaign conducted by Sir Hugh Rose (Lord Strathnairn).

Parliamentary History. The Mutiny was the death-blow of the East India Company. On several previous occasions Indian affairs had occupied the attention of Parliament. The first important compact between the Home Government and the company was in 1766, when the Ministry stepped in to regulate the commercial affairs of the company and to share in the wealth of the Indian kingdom which it had so suddenly acquired. Reports of misdoings of the company's servants, and disorder in its finances, led to the first great Parliamentary inquiry into the company's affairs and to the passing of the Regulating Act of 1773, under which Warren Hastings became the first Governor-General. In the proceedings connected with the

trial of Warren Hastings the affairs of the Company were much discussed, and the responsibility of England for the welfare of the population, subject to the company's authority, was brought home to the public mind. At intervals of twenty years from 1793, the charter of the company was renewed. In 1813 its monopoly of Indian trade was abolished; in 1833 it was compelled to give up its China trade and devote itself wholly to the work of government. In 1853 its patronage was abolished, and the Indian Civil Service thrown open to public competition. In 1858, by the Act for the Better Government of India, the Company itself was done away with.

British India under the Crown. Governors-General: under Edward VII.:—Lord Curzon (1901-5), and the Earl of Minto (1905-10); under George V., Lord Penshurst (1910).

Since 1858 the only great direct acquisition of territory has been obtained by the annexation of the Kingdom of Burma at the close of the Burmese War in 1885; the authority of the Indian Government has, however, been extended over the whole of Baluchistan, and consolidated over Kashmir and its northern dependencies up to the Hindu Kush. The Afghan War (1878-80), after vicissitudes of success and disaster, added permanently some small tracts of territory to the empire, and left Afghanistan internally independent, but as regards its foreign relations dependent on the British power. In virtue of this dependence, the northern boundary of Afghanistan from Persia to the Oxus was demarcated by an Anglo-Russian Commission (1885-86). The nineteenth century was distinguished by the vast extension of public works, especially railways, and by reforms in administration. Of these the most conspicuous are the decentralising measures adopted by Lord Mayo and extended by Lord Ripon, various rent laws for the better protection of the cultivators. Hardly less important are the military measures that have been taken for the improvement of the army and for the defence of the north-west frontier. There was considerable agitation among Bengalis in 1905-7, owing to the partition of Bengal, by which an area of 10,000 square miles, with a population of 20,000,000, was formed, with Assam, into the new province of Eastern Bengal and Assam, with a capital at Dacca. Owing to consequent agitation a Seditious Meeting Act was passed in 1907. For a short period in 1907 there was unrest in the Punjab, not a little of which was incited by the injudicious exercise by certain newspapers using the vernacular of the liberty of the Press. The incidents led to the passing in 1908 of the Newspapers (Incitement to Offences) Act. Much of the discontent in India during 1908-9-10 arose from evolutionary causes. The introduction of wider facilities for the education of the native some years ago has produced a generation which has outgrown the nebulous mentality of their forbears, and in the first zest of newly acquired intellectual expansion, inflated ideals have come into being. These ideals range from the acquirement of a larger share in the present system of administration to complete emancipation from British tutelage. Added to this are important factors in social, religious, and economic conditions which

are too diversified to enumerate. The seat of the trouble is almost entirely confined to the Hindi centres, and mainly to the large towns of the Mahratta Deccan, Bengal and the Punjab, and in reality—though given much prominence and causing loss of life—affect only one tenth of the population. The more important movements arising out of this unrest are the *Swadeshi*, the *Swaraj*, and the "National Volunteers."

The *Swadeshi* movement aims at the development of Indian trade, by working to prohibit importation of British goods. To this movement a considerable discredit has attached by the violent actions of professional agitators, identifying themselves with the *Swadeshi*. The objective of the more powerful *Swaraj* faction may be briefly summed up as "Home Rule for India," to secure which *Swadeshi* gives the initial impulse. The programme of the *Swaraj* movement is to "so work in the country, so combine the resources of the people, so organise the forces of the nation, so develop the instincts of freedom in the community," that by such means they can "compel the submission of any opposing power." The National Volunteers are to be found among the Babus and Hindus, and semi-military drills are engaged in.

The Administrative System. The British administration in India is based on the Act of 1858, "for the Better Government of India," by which the territories of the East India Company were transferred to the Crown. In 1877 Queen Victoria assumed the additional title of "Empress of India." The Secretary of State for India, aided by a Council, controls administration from London. In India the supreme authority "the Governor-General in Council," who has in certain circumstances power to act independently of his Council, is appointed by the Crown, his tenure being ordinarily for five years.

His Council has two forms: a smaller body—the Executive Council—consisting of the Commander-in-Chief in India as an "extraordinary" member and of (usually) six "ordinary" members; and a larger body—the Legislative Council—consisting of these members, together with "additional members for making laws and regulations." The Executive Council meets frequently, and decides on all important questions of foreign policy and internal administration. The business of the Supreme Government is divided into the various departments of Finance and Commerce, Home Affairs, Revenue and Agriculture, Military Administration, Legislation, Public Works, and Foreign Affairs. The Governor-General himself specially superintends the business of the Foreign Department, which includes questions concerning the native feudatory states in India as well as what are more strictly foreign affairs.

The Legislative Council meets for the purposes of legislation and for the discussion of the Budget proposals, in connection with which members have also the power of putting questions to the Government, though not of carrying their opinions to a vote. The Legislative Council includes the members of the Executive Council, the governor of the province in which the Council sits, certain officials

selected by the Governor-General from the various provinces of India, and nominated representatives of the native and European communities. By the Act of May, 1909, the number of these was increased from 16 to 54, and the total Council now numbers 68 members.

There are Executive Councils of three members each in Madras and Bombay, and Local Legislative Councils similar to the above in Madras, Bombay, Bengal, and the United Provinces. Decentralisation is a characteristic of the existing British administration in India. Important financial, executive, and legislative powers are delegated to local authorities. Subordinate to the Supreme Government there are thirteen "Local Governments and Administrations." These vary in importance and in constitution, and in the degree of their dependence on the Supreme Government. Two—Madras and Bombay—are under Governors appointed by the Crown, assisted by Local Executive and Legislative Councils. They have separate local armies under local commanders-in-chief, which, however, are likely soon to be abolished, and they have in some minor matters the privilege of corresponding direct with the Secretary of State. Four—Bengal, the United Provinces of Agra and Oudh, Eastern Bengal and Assam, and the Punjab—are under Lieutenant-Governors. The first two have Local Legislative Councils; the others—Burma and the Central Provinces—are under officers styled Chief Commissioners of those provinces. The remaining five—Berar, Ajmere-Merwara, Coorg, British Baluchistan, and the Andamans—are less important, and in the charge of Chief Commissioners directly subordinate to the Governor-General in Council. The last is little more than a penal settlement; the four others are small territories of which the administration is presided over *ex officio* by the Political Residents or Agents respectively in Haidarabad, Rajputana, Mysore, and Baluchistan, who have also the title of Chief Commissioner in respect of these territories which they directly administer.

In the administration of the various provinces of India there is a distinction, which used to be of greater importance than it is now, between "regulation" and "non-regulation" provinces or districts. The "regulations" were the old rules of law and practice adopted in the earliest acquired territories. They were found to be unsuited to many tracts subsequently acquired, especially to such as were of a more backward civilisation. In districts in which the regulations were not enforced, or non-regulation districts, the officials were less bound by rules of procedure, enjoyed larger powers combining fuller judicial with executive functions, exercised a wider discretion, and were more freely recruited from the military service. The real differences between "regulation" and "non-regulation" provinces tend to disappear. In name the difference is preserved by the title of the district officers, who in the former (*e.g.* the Bengals, Madras, Bombay, and the United Provinces) are called Collector-Magistrates, and in the latter (*e.g.* Punjab, Burma, Oudh, Central Provinces, and Sind) Deputy-Commissioners.

In the whole of British India there are 254 districts. A Collector-Magistrate or Deputy-Commissioner, as the case may be, controls each district. He must attend to the interests of all classes, and be acquainted with everything that goes on, and be an adviser on every matter of public importance. Nothing is outside his province, because he is the representative of a paternal government. The districts being the separate units of administration, the force which maintains harmony among them and moulds them into uniformity is the Secretariat, the central bureau of each province, which receives the multifarious reports from every part, records them for reference, and issues orders for the regulation of all details of administration.

The Act of May, 1909, referred to, also gave enlarged powers and greater membership to the Provincial Legislative Councils. During 1909-10 also the Imperial Parliament have been giving attention to a scheme for the reorganisation of municipal administration, whereby the old *punchayets* or village councils may be revived and largely extended, and Unions of such villages formed, as well as to other matters tending to the ultimate benefit of the natives in their internal affairs.

The law administered by the British Indian courts consists partly of statutes of the British Parliament, partly of laws of the Indian legislatures, partly of Hindu and Muhammadan domestic laws and laws of inheritance, and partly of customary law affecting particular castes and races. It must be remembered that the British Indian legislatures have no power to make laws for territories of native states, which are all equally in this respect independent. Certain "scheduled" districts in British India, being mostly tracts very backward in civilisation, are also exempted from British Indian laws, unless these are specially applied to them by the Governor-General in Council in his executive capacity.

At the head of the administration of justice in the various provinces of India are the following courts, which are supreme both in civil and criminal business:—High Courts in Bengal, Madras, Bombay, and the United Provinces, the court at Calcutta having jurisdiction over Assam has, since the partition of Bengal, been removed to Dacca, the capital of the new province; a Chief Court of four judges in the Punjab; a Chief Court consisting of two judicial commissioners, in Oudh; a judicial commissioner in the Central Provinces; two judicial commissioners and a recorder in Burma; while in the minor administrations the chief commissioner is himself also the Chief Court. An ultimate appeal lies from the courts of British India (as distinguished from the India of the native states) to the Judicial Committee of the Privy Council in England.

From the table on page 4, it will be seen that most of the provincial governments have groups of native states subordinate to them, but that the larger and more important are directly subordinated to the Government of India.

The native states, of which there are nominally 800 in India, vary greatly in size, importance, and

degree of independence—from Haidarabad, which is as large as Italy and almost wholly free from interference in internal administration, to petty estates in Kathiawar, only a few square miles in area, of which the chiefs have often not even magisterial powers. The system of government in these states was originally of the usual Oriental type, arbitrary despotism tempered by the force of custom and the right of rebellion. The right of rebellion has now been withdrawn and replaced by the control of the paramount power, which, through its Political Residents and Agents, also exerts a constant pressure, stronger and more direct in some cases than in others, to induce the native chiefs to adopt and maintain regular and improved systems of administration of the kind in force in British India. In case of serious misgovernment, or of failure to listen to the advice of the representative of the paramount power, the native chief can be dethroned or his powers of government temporarily withdrawn. In even the most independent of these states the sovereignty is limited by the fact that they have no power either of making peace or war.

Finance. The unit of currency in India is the rupee, which used to be approximately equal to 2s., but of which the value has latterly fallen to as low as 1s. 4d. The accounts of British India are stated in tens of rupees, indicated by the symbol Rx. The difference between the position and functions of government in England and India is apparent on observing the most important items in the Indian Balance Sheet. Taking the accounts of 1909-10, the principal figures are:—

	Receipts.	Rx.
Land revenue	31,34,81,000
Opium	6,62,40,000
Salt	4,98,00,000
Other taxation	23,18,70,000
Railways, Post, & other Public Works	...	36,77,25,000
Tribute and other receipts	7,76,48,000
Total (£73,750,983)	Rx	1,10,62,64,000
<i>Expenditure.</i>		
Collection of revenues	10,83,96,000
Civil administration	28,96,72,000
Army	31,06,23,000
Interest	2,99,49,000
Railways, Post, & other Public Works	...	28,52,46,000
Famine and miscellaneous	10,83,68,000
Total (£73,520,000)	Rx	1,10,28,00,000

The estimates for 1911, however, provide for an expected deficit of £750,000.

The figures for land revenue, opium, and salt point to the fact that in India the State is the universal landlord, and a great manufacturer of salt and opium. It is, moreover, a great builder and constructor of railways, irrigation canals, and other public works; indeed, in the first two items, there is for 1909-10 a capital expenditure of Rs. 12,89,12,000 beyond the figures shown in the balance sheet above. It also works profitably a large forest property, as well as a cheap postal and telegraph service, and incurs yearly expenditure in dispensing famine relief.

The actual taxation—much of the revenue is not derived from taxes—falls on the population of British India at the rate of less than Rs. 2½, or (with the exchange 1s. 3d. the rupee) about 2s. 8d. a head.

The incidence of taxation is not only infinitely less than in England, but is lighter than in the India of Akbar's empire, and is lighter than it is at the present time in the native states of India, though these states have to bear but a small portion of the burden of Imperial defence. For the first time in fifteen years new taxes were imposed by the Budget estimates for 1911, by which £1,800,000 would be realised in aggregate. The army, which absorbs more than half the net revenue of India, consists of about 78,318 British and 158,054 native troops. There are also 34,000 Volunteers, and 20,189 Imperial Service troops, the latter supplied and equipped by native rulers. The difficulties and the cost of Imperial defence have largely increased with the approach of the Russian Empire to the Indian frontier. The 1910 Indian Budget, however, showed a decrease of £463,900 in the military expenses, and the estimates for 1911 provide for an increase of pay to the native troops amounting to £426,000. The debt of India is relatively not very heavy. Deducting that portion which has been incurred for productive works, the national debt of India is about equal to one year's net revenue, say 40 to 50 million tens of rupees.

Land Revenue. "The subject of land administration in its widest sense comprehends not only the collection of the revenue, together with the elaborate process of assessing the revenue known as 'settlement,' but also the determination of the individuals or communities upon whom the assessment is levied, and to some extent a consideration of the tenure holders (if any) subordinate to these individuals or communities. The rent, or at least a considerable portion of the rent, is acknowledged by ancient custom to be due to the State, unless it happens to have been specifically surrendered in favour of some official personage or religious grantee. In such cases the land is known as *lakhiraj*, *inam*, or 'alienated'; but it is not the land, strictly speaking, that is alienated, but only the right to receive the Government share of the produce. Elsewhere the dominant claim of the State to exact its share is uncontested, though, as a matter of fact, it is exercised very differently in the different provinces. In ultimate resort, the land revenue must everywhere alike be paid by the actual cultivator of the soil, the *rayat*, petty tillage by peasants being universal throughout India. But for many reasons the State does not everywhere levy payment directly from the *rayat*. In some parts, as in Bengal, an intermediate class, half revenue agent, half feudal chief, called *zamindars*, were found in possession of the right of collecting the revenue from large tracts of country with the duty of paying it over, after certain deductions, to the State. By the measure known as the Permanent Settlement (1793) the revenue paid by the *zamindars* was fixed in perpetuity, while the *zamindars* were declared to be landlords, and the *rayat* gradually dropped to the position of their tenants. In the north-west provinces and the Punjab the village has always been the unit of revenue payment, whether the village be owned by one landlord or many, or by a joint community. The system in the central provinces combines features from

Bengal with features from the north-west. In Madras and Bombay, for the greater part, as well as in Assam and Burma, the settlement is *rayatwari*, recognising no one between the cultivator and the State."

Agriculture. Three-quarters of the population of India is agricultural, immediately dependent for their livelihood on the cultivation of the soil. Naturally the practice of agriculture shows infinite variety throughout the country. The seasons admit of two, and sometimes three harvests, in the year, but not necessarily, nor indeed usually, on the same fields. Agricultural statistics in the greater part of British India are fairly complete. The area devoted to crops is about 238,000,000 acres, of which nearly 76,000,000 grow rice, over 18,500,000 grow wheat, and 92,000,000 millets, pulses, and other grain. Cotton is grown on 14,000,000 acres; oil-seeds account for 12,500,000 acres; on 2,700,000 sugar-cane is grown; on 513,500 tea is cultivated; on 405,000 indigo is grown; while tobacco is raised on 974,500 acres. The figures are those for 1907-8, and include the statistics of Bengal. Besides cotton, other fibres occupied 4,689,371 acres; and in Madras and Coorg 1,000,000 acres were devoted to coffee. Owing to unusually favourable climatic conditions, the 1909-10 harvest showed some striking but abnormal results; the 1909 cotton crop was 22 per cent. better than 1908, the rice crop 78 per cent. better, whilst the 1910 wheat crop was 3,500,000 tons more than 1908. Rice is a crop which requires much moisture, and is grown most largely in Lower Burma, Bengal, Eastern Bengal, and Assam, and the deltas of the Madras rivers. The great wheat-growing tract of India is the Punjab. Much of the exported wheat also comes from the United Provinces and the Central Provinces. The millets form the chief staple food of the Indian population, the principal varieties being the great millet (*jowar* or *jamari*) and spiked millet (*bajra*). Of oil-seeds, the export of which has largely increased in late years, the four chief kinds are mustard or rape-seed, linseed, gingelly (*til*), and castor-oil. Vegetables and fruits of various kinds, spices and palms are much cultivated. Sugar is an exhausting but often a lucrative crop. Of late years the manufacture of Indian sugar for export has much declined. Of non-food crops cotton holds the first place. The cultivation of jute is confined to Bengal, Eastern Bengal, and Assam. Indigo is grown largely by European planters, chiefly in Behar, and by native cultivators in the United Provinces, the Punjab, and Madras. Opium cultivation is confined to the Ganges valley round Patna and Benares, and to the native states territories in central India. Tobacco is grown in every district for local consumption. Coffee culture exists in Coorg and Mysore, and other tracts on the eastern slopes of the Western Ghats, south of Kanara. The cultivation of tea is a comparatively recent introduction of European enterprise. The principal gardens are in the new province of Eastern Bengal and Assam, especially on the Himalayan slopes, near Darjeeling, in the North-West Provinces in Kumaun and Garwhal, and in the Punjab in the Kangra district. There is also a small area under tea on the Nilgiris in Madras.

The quinine-yielding cinchona was introduced from Peru into India in 1860. Plantations have been successfully grown in the hills of southern and north-eastern India. Silk cultivation is a declining industry in India. Bullocks, cows, and buffaloes, with sheep and goats, form the chief agricultural stock throughout India. There is a considerable number of camels and horses also in the Punjab.

Irrigation. Much of the cultivation in India depends on irrigation, whether procured by indigenous works or from canals constructed by the British Indian Government. Some of these canals are the largest in the world. On their construction about 33½ millions (Rs.) have been spent, on which outlay the State receives a net return per cent. (1908, 7·65) per annum. The area irrigated by the Government canals is about 22,000,000 acres. The most profitable of these are those which fertilise the deltaic systems on the Madras coast, and those in the Punjab, and United Provinces, which draw their supply from the great northern rivers as they issue from the Himalayan range. In Sind, too, irrigation has been very successful, the cultivation that there exists depending almost wholly on the inundation canals drawn from the flood waters of the Indus.

Famines. The famines of India have given the strongest stimulus to the Government in its irrigation policy. Several of these have occurred during British rule in India. In the famine of 1769-70 a third of the population of Bengal is said to have perished; in 1780-83 and 1790-92 southern India was afflicted; in 1838 the old North-West Provinces suffered. In more recent times occurred the Orissa famine of 1866, of short duration and in a limited area, but so severe that perhaps one-fourth of the population of Orissa died. This was followed in 1868-69 by a widespread scarcity over the North-West of India. In 1873-74 Behar and the old North-West Provinces were again threatened with severe famine. In 1876-78 occurred the widespread and prolonged famine, which was especially severe in southern India. In 1896-9, and the opening years of the present century, other severe famines occurred. There has also been distressing mortality owing to the ravages of plague, from which in the last fourteen years over 5,000,000, and from January to June, 1910, 374,000 persons have died.

Railways. Next to irrigation, the most useful means of combating famine are communications, especially railways. By the end of December, 1908, the railways in India had a length of 30,576 miles, constructed partly by companies enjoying a Government guarantee of interest, and partly by the State itself (23,633 miles), at a total capital outlay of Rs. 4,20,67,49,000 = £280,447,266 (including lines under construction), which showed a return of 4·33 per cent. in 1908. The other principal means of communication are the roads which the British Government have been very active in extending in all the provinces, and the great navigable rivers, especially the Ganges, Brahmaputra, Indus, and Irawadi, and some of the Government canals, which have been made available for navigation as well as irrigation.

Trade. The extension of internal communications would have of itself given a great impetus to the sea-borne trade of India; but to this has been added the opening of the Suez Canal, the improvement and cheapening of navigation, the improvement of seaports, the abolition of almost all internal and external custom duties, and the increase of cultivation. At the same time new industries have been founded, mines opened, and new and valuable agricultural staples naturalised.

The domestic industries of India, such as weaving and spinning, pottery, brasswork, ironwork, and art-work of many kinds, continue to be practised all over India; but they tend to give way gradually where they come into competition with the cheaper cotton yarns and fabrics and the iron and steel products of British factories. At the same time the cheapness of Indian labour and the production of raw materials within easy reach have encouraged the establishment in India of steam-power factories for spinning and weaving cotton and jute, for making paper, husking and cleaning rice, sawing timber, and other industries. The cotton-mills, of which there are 238, mostly in Bombay, and the jute-mills, 51 in number, mostly in Bengal (1909), are a conspicuous outcome of this new spirit of industrial enterprise.

The rapid growth of the foreign trade of India appears from the following facts. In 1834 the trade was valued at about £10,000,000 sterling. In 1858 it had increased to £40,000,000, and in 1910 was valued at £123,000,000 of exports and £101,000,000 of imports. In the last twenty years the trade has doubled. By far the larger share of Indian trade, over 65 per cent., is conducted with the United Kingdom; China comes next with 12 per cent.; and Germany, France, the Straits Settlements, Egypt, Belgium, the United States, and other countries follow with decreasing shares. Of the shipping, 12,910,823 tons, by which this trade was carried in 1908-9, 80 per cent. flew the British flag. A characteristic of Indian trade is the large excess of exports over imports of merchandise, averaging 19,000,000 tens of rupees, of which a third to a half is covered by the net imports of gold and silver each year into India. The remainder of the balance of trade goes to pay for interest on foreign capital invested in India and to meet the home charges of the Indian Government. Excluding treasure, the principal articles of foreign sea-borne trade may be seen from the following figures stated in pounds sterling, relating to the year 1908-9 :—

Imports into India (excluding Government Stores).

Cotton manufactures	£25,343,000
Metals	8,663,000
Woollen Goods	1,941,000
Alcs and spirits	1,323,000
Chemicals	498,000
Machinery	4,411,000

Exports from India (including re-exports).

Wheat and Flour	£1,241,000
Rice	10,593,000
Seeds	7,785,000
Cotton, Yarn, and Cloth	21,621,000
Opium	6,233,000
Tea	6,929,000
Jute	13,223,000

All imports are free, excepting arms and ammunition, opium, liquors, petroleum-oil, and salt. There is an export duty on rice; and export opium pays a monopoly profit, or an internal duty to Government, according as it is grown and manufactured in British India or in the native states. In other respects trade is free. The coasting trade of India for the year 1908-9 was 1,06,74,11,713 rupees, and the foreign land trade was 13,46,01,069 rupees for the same period, one third being with Nepal.

Minerals. There is no great production of mineral wealth. There is plenty of iron-ore, which is worked in a small way by the natives, but with too great a waste of charcoal to make the industry profitable on a large scale. Ironworks on European methods have been opened in Bengal, but the difficulty of obtaining suitable coal, iron, and limestone in the same locality makes it unlikely that production of iron will ever be considerable in India. In regard to collieries the prospect is better. The production of Indian coal is steadily increasing, and now exceeds 13,000,000 tons a year. Salt is obtained in India partly by evaporation of sea-water or of the water of inland salt lakes, and partly by mining or quarrying the solid salt of the Punjab Salt Range. A kindred mineral product is saltpetre, of which India has the only natural supply, but fiscal regulations for the protection of the salt revenue restrict its manufacture. Gold is to be found in small quantities in many parts of India. In recent years mining in the auriferous quartz reefs of southern India has been successfully undertaken, the production of gold amounting to half a million sterling a year. Copper is worked in the Himalaya region, and rich deposits of tin have been found in Burma. Burma also possesses the only supplies of petroleum-oil which have as yet been profitably worked in India. Other oil-beds exist in Assam and the Punjab and in Baluchistan. Ruby and jade mines exist and are worked in Upper Burma, but they have not as yet in English hands produced any great quantity of stones. Diamonds are still found in small quantities in some parts of India, but the old sources of supply in the Nizam's dominions seem to have been exhausted, or their wealth has been much exaggerated. Pearls are obtained off the Madras and Burma coasts, but the supply is not large.

Ethnology. In India the ethnical relations have been complicated not only by the intermingling of races and languages, as elsewhere, but also by the introduction at an early date of the institution of caste, with its various political, religious, and social bearings. Thus there are not only non-Aryan peoples, such as the Mahrattas and Uriyas, who now speak Aryan languages, but there are also non-Aryan peoples, such as the Namburi and Nayars of Malabar, who claim to be Brahmans and Kshatriyas, that is, members of the highest Aryan castes, reserved originally for the priestly and warrior classes. The original Kshatriya caste has, in fact, disappeared altogether, and the Rajputs, although now recognised as Kshatriyas by the Aryan Brahmans, appear to have reached India not earlier than the 4th century of the new era, probably 3,000 years after the arrival of the first Aryan in-

truders. It is also to be noticed that these intruders were not forbidden by the Vedic laws from intermarrying with the aborigines; the interdiction was introduced long after in the Brahmanic laws of Manu, when the caste system was invented to save the dominant Aryans from total absorption in the surrounding indigenous populations. Extensive interminglings had thus already taken place, so that caste, instead of being a safe test of racial purity, is really an additional element of confusion in the extremely intricate field of Indian ethnology.

So involved have the relations become, that nearly all attempts at a systematic classification of the inhabitants of the peninsula resolve themselves into a classification of their languages which, as seen, are no more trustworthy than caste itself as indications of racial origin. On this basis there are five very unequally distributed groups—that is, groups speaking dialects of radically distinct languages, three of which (*Dravidian* spoken by 56,000,000, *Kolarian* by 4,000,000, and *Khassi* by 200,000) are confined to the peninsula, while two (*Aryan*, 221,000,000, and *Tibeto-Burman*, 9,000,000) are common to other regions. It is natural to suppose that those speaking the three indigenous languages are themselves indigenous, or at least represent the aboriginal and earliest known sections of the population, and this to a large extent is the case. It is, however, to be noted that India appears to have been first occupied by none of these groups, but by a black, dwarfish race resembling the Negritos still surviving in the Philippines in the Malay Peninsula and in the Andaman Islands. This black element no longer forms anywhere a separate ethnical group speaking any primitive Negrito tongues, all of which have entirely disappeared. Nevertheless, it is still strongly represented by numerous low-caste or outcast mixed Negroid communities, chiefly of Kolarian or Dravidian, but also of Aryan speech. Such are the Maravars of the district of Madura and near Cape Comorin; the Veddhas also in the extreme south, akin to the Veddhas of Ceylon; the Kurumbas of the Nilghiri mountains; many of the Gonds on both sides of the Vindhya; the Khonds farther east, the Mundas of Chota-Nagpore, and many others, all dark enough to be called black, and little over 5 feet high, with black hair either lank or frizzly. All here mentioned are of Dravidian speech except the Khonds and Mundas, who speak Kolarian dialects. The Negritos were probably followed by the Kols, who give their name to the Kolarian linguistic group, and many of whom still retain their primitive Kolarian language. But the majority (all the Gonds and others) now speak Dravidian dialects, and are consequently classed with that division. The Kols entered India almost certainly from the north-east, and are now exclusively confined to the central uplands between the Ganges basin and the Dakhan. Then came the Dravidians, but still in extremely remote times, either, like the Kols, from the north-east, or more probably from the north-west, where they are still supposed to be represented by the Brahui of Baluchistan. At one time the Dravidians must have occupied almost the whole of India from the foot of the Himalayas to Ceylon; but by the intruding

Aryans they were partly exterminated or assimilated, partly driven from the plains of the Indus and Ganges southwards to the Vindhya and the Dakhan, which they still hold.

It is generally assumed that the Aryans, by whom the peopling of India was virtually completed, arrived from the north-west in a single body, settling first in the Punjab and thence moving slowly southwards to Rajputana and eastwards to the Ganges—movements which may be followed by the light of the Vedic poems, their oldest literary monument. But recent research has shown that there was not one, but several waves of Aryan emigration from the Iranian plateau to the peninsula. It may even be questioned whether the “Vedic Aryans” were the first arrivals; but in any case they were accompanied neither by the Jats nor by the Rajputs, who represent separate migratory movements, and who were both Aryan peoples, though not necessarily of Sanskritic speech. Sanskrit, however, in various Prakritic or vulgarised forms, ultimately became the exclusive language, not only of all these Aryan populations, but also of all the aborigines throughout the Indus and Ganges basins as far south as the Dravidian and Kolarian domains, and north to the slopes of the Himalayas. Here it became, and still is, conterminous with the domain of the Tibeto-Birman peoples, who have never advanced far into the Indian lowlands except in the extreme north-east (Assam), where they have been Aryanised. Sanskrit has also invaded the Dakhan, where some millions of Mahrattas, originally Dravidians, now speak a Gaurian (Neo-Sanskritic) tongue; it has even penetrated to Ceylon, where Singhalese, current in the southern half of the island, has been profoundly modified under Aryan influences. Altogether probably not more than one-third of the 221,000,000 classed as Aryans, because of their Aryan speech, are Aryans by descent, and even of these a large percentage show traces of interminglings with the aborigines. Most of the Brahman caste, the bulk of the Jats and Rajputs—regarded by some authorities as essentially the same people—and the Aryan-speaking inhabitants of Cashmere and Dardistan may be regarded as full-blood Aryans. But all the rest are either half-castes, or simply Aryanised Dravidians and Kolarians. Thus the outcome of the struggle between the two great conflicting elements is that India still remains mainly Dravidian ethnologically, while it has become mainly Aryan in speech and general culture. [Details under articles DRAVIDIANS, GAURIAN, JATS, KOLARIANS, RAJPUTS.]

Indians, AMERICAN, conventional name of the aborigines of the New World, so called by Columbus in the belief that on reaching the Antilles he had discovered India, and that the natives must consequently be “Indians.” There is a general consensus amongst the best modern ethnologists that these aborigines form a single more or less homogeneous division of mankind, having in common at least one physical feature—long, black, lank, and lustreless hair of the horse-tail type—and one mental feature—an order of speech best described as *polysynthetic*, that is, a tendency to merge the

various parts of the sentence in a single composite word of inordinate length. The physical feature they share with the Mongolic branch of the human family; the mental is peculiar to themselves, occurring in no linguistic group outside the American continent. Basque, the only fully incorporating language of the Old World, comes nearest to the American type; but the difference is still fundamental, for Basque incorporates only certain pronominal elements with the verb, whereas the American tongues embody the nominal as well as the pronominal subject and object, the capacity extending in principle to all the parts of speech. But despite this diversity, due to long isolation in the New World, the American Indians are generally regarded as an offshoot of the Mongolic race, which became detached from the Asiatic stock at an extremely remote epoch, probably before the two continents were separated by the present narrow and shallow waters of Behring Strait. Many groups both in North and South America—such as some of the Californian natives and the Botocudos of Brazil—still betray distinct Mongolic characteristics in their yellowish complexions, broad, flat features, and low stature. But the bulk of the aborigines depart from that type, especially in their prevailing reddish or coppery colour, shading off to dark brown on the Peruvian and Bolivian uplands, and even to a fair and almost whitish hue on the north-west seaboard; in their tall stature (Prairie Indians and Patagonians), in their large arched nose, receding forehead, and massive hatchet-shaped head, very full about the jaws, with a light prognathism.

These physical discrepancies are also reflected in the intellectual qualities and social relations, ranging from the absolutely savage and debased condition of the Fuegians, the Bolivian Chiquitos, and Californian "Diggers," through almost every grade of culture to the fairly civilised Arizonian Pueblos, Mexican Aztecs, Colombian Chibchas, and Peruvian Quichuas. The civilisations developed by these cultured peoples, with whom might perhaps be included the Mound-builders of the Mississippi Basin, the Veraguas of Central America, and certainly the Mayas of Yucatan, are often attributed to Chinese, Japanese, Buddhist, Egyptian, and other foreign sources. But the total absence of the useful plants (rice, wheat, barley, oats, rye) and domestic animals (ox, camel, horse, sheep, pig, dog, poultry) peculiar to the Old World, as well as of the Egyptian, Chinese, and other Oriental languages and writing systems, plainly shows that these peoples exercised no influence or never came in close contact with the civilised inhabitants of the New World, whose cultures must consequently be regarded as purely local developments. A stray Japanese junk, or Malay prau, stranded on the shores of the Pacific (for such arguments are appealed to), could explain nothing, seeing that the Pueblos were erecting their *casas grandes*, the Toltecs their truncated pyramids, the Mayas their elaborately-ornamented temples and palaces, long before the Japanese or Malays themselves were civilised enough to build craft capable of plying regularly on the South Seas.

Although cast in a common polysynthetic mould,

the American tongues have often very little else in common, and relatively to its population the New World presents far more radically distinct forms of speech—"stock languages" as they are called—than any other continental region, more perhaps than the whole of the Eastern Hemisphere together. Yet so great is the general uniformity of the physical type—as, for instance, throughout the boundless rolling plains of the Mississippi-Missouri basin—that Powell and other leading American ethnologists find language the most convenient basis of classification. Even a specialist will not undertake to distinguish off-hand an Iroquois from an Algonquin, a Dakota from a Kiowa. Yet these Prairie Indians, so like in outward appearance, speak each a different stock language. Some of these languages occupy a vast domain, while others are confined to quite narrow limits; and, speaking generally, the immense majority of the independent linguistic groups are in North America crowded together along the Pacific seaboard and on the Mexican plateau. In South America the classification is still far from being worked out; but it appears that here also the greater part of the territory is occupied by a few widespread families, while all the other numerous independent groups are confined to relatively small areas. The geographical position, tribal subdivisions, and other details are given under their respective entries.

From the West Indies the aborigines have disappeared, mainly exterminated by the first Spanish settlers and replaced by blacks from Africa. In Anglo-Saxon America (the Dominion of Canada and the United States), they never were numerous, probably not more than half a million at any time. Here they were either exterminated or repelled, or confined to reservations everywhere, except in parts of Canada, where some intermarried with the early French settlers, giving rise to a sturdy race of half-castes which persists. The full-blood Indians are diminishing, having fallen in Canada from 132,000 in 1881 to 110,345 in 1907; in the United States the Indians numbered 298,472 in 1907. Total in Anglo-Saxon America, estimated 1907, at about 400,000, of whom 30,000 in Alaska, 14,000 in Greenland and Labrador, the great bulk of the rest in Indian territory and other reservations. In Latin America (Mexico, Central and South America, except British Honduras, British and Dutch Guianas) the relations are totally different. Here the Spanish and Portuguese intruders almost everywhere amalgamated with the natives, producing a race of mestizos (half-breeds) estimated at about 30,000,000, and forming the dominant class everywhere, except in Costa Rica, Chili, the extreme south of Brazil, Uruguay, and parts of Argentina (Buenos Ayres, etc.), where alone the whites are in a majority. "In Spanish America the bulk of the population consists of Hispanified Indians" (Reclus, vol. xvii., p. 10, English edition). Even the full-blood Indians, who number altogether considerably over 2,000,000, form in some places the majority, as in Guatemala, where they are 60, the half-castes 38, and the whites only 2 per cent. of the population. In San Salvador also there are only 10,000 whites to 674,000 full-blood and half-caste aborigines. This process of

miscegenation has been disastrous to the higher races for the mestizos, while greatly improved in physique (many of the women especially are quite lovely), have retained some of the worst moral qualities of the Indians. Under a grave demeanour and apathy are often concealed fierce passions and a revengeful, lawless spirit, leading to great social disorders and constant political convulsions. It is this racial debasement that prevents the Spanish and Portuguese states from benefiting by their free democratic institutions, and which must ultimately give the absolute supremacy to the peoples of English speech, who have preserved their racial purity in the New World.

Indiarubber, the dried, coagulated, milky juice, or latex (q.v.), of various tropical trees and shrubs, belonging principally to the orders Euphorbiaceæ, Moraceæ, and Apocynaceæ. They occur principally within about 500 miles or 7° of the Equator, between the isotherms of 70° F., and where the annual rainfall is about 90 inches. The latex, which occurs chiefly in the inner bark, whence it is obtained by incisions, is an emulsion in which the rubber is suspended. The rubber, or caoutchouc, itself, when pure, is odourless, nearly white, elastic, having a specific gravity slightly exceeding .9, insoluble in water, alcohol, alkalies or unconcentrated acids, but soluble to some extent in benzole, ether, and volatile oils, or, more perfectly, in chloroform or carbon disulphide. It is believed to be a mixture of two substances both having a composition represented by $(C_{10}H_8)_x$ —one, fibrous and insoluble in benzole, merely swelling up into a paste; the other, the predominating constituent of inferior rubbers such as those of Guatemala and Africa, viscous and soluble.

The chief kinds of rubber are the South American, including the *Pará*, *Ceara*, *Pernambuco*, *Cartagena*, *Guayaquil*, and *Demerara*; the Central American, including the *West Indian*, *Guatemala*, and *Jamaica*; the African, including the *West African*, *Liberian*, *Mozambique*, and *Madagascar*; and the Asiatic, including *Assam*, *Rangoon*, *Singapore*, *Penang*, *Java*, *Borneo*, and *Fiji*.

Of these the *Pará* is by far the most important. It is the product of *Hevea* (formerly called *Siphonia*) *brasiliensis*, a much-branched euphorbiaceous tree, reaching 60 feet in height and bearing trefoil leaves, together with other species, growing in the rich alluvial clays of the Amazon valley. They have here a temperature reaching 89° to 94° F. at noon and never below 73° at night, and almost daily rain. The rubber is collected between August and February, each tree yielding about 6 ounces of juice, about 32 per cent. of which is rubber. The best quality is exported in flat, round cakes or "biscuits," which rarely contain more than 15 per cent. of moisture, whilst balls of less pure scrapings, known as "negro-head," often contain 25 to 35 per cent. of impurity. Through the agency of our gardens at Kew the *Pará* rubber has been successfully introduced into South Burma, Perak, and other colonies.

Ceara rubber is the product of another euphorbiaceous tree, *Manihot Glaziovii*, growing 30 feet

high, in a dry, stony region with a temperature from 82° to 90° F., in Rio Janeiro. From the mode of collecting, this rubber often contains 25 per cent. of impurities. The plant has been most successfully introduced from Kew into Ceylon, the Nilgiri Hills, Calcutta, and Zanzibar.

Pernambuco or *Mangabeira* rubber, a far less valuable kind, is the produce of the apocynaceous tree *Hancornia speciosa*. The *Cartagena* and *Guayaquil* rubbers are believed to be, at least in part, the produce of the large moraceous tree *Castilloa elastica*, which is also the chief source of the Central American rubbers. It grows in rich soil near streams throughout Southern Mexico, Central America, North-Western South America as far south as Chimborazo, in Cuba and in Hayti, and has now been successfully established in Ceylon. Most Central American rubber, of which that from Guatemala is very inferior, is exported to New York; but some of the best—that known as *West Indian*, though grown on the mainland—comes to England. *Demerara* rubber or *Macwarrieballi*, the product of the twining apocynaceous shrub *Forsteronia gracilis*, and *Jamaica* rubber, from the "Milk Vine," *F. floribunda*, though as yet little known, are likely to prove valuable.

The chief African rubbers are the produce of the apocynaceous lianas, belonging to the genus *Landolphia*. *L. ovariensis* occurs from Sierra Leone to the mouth of the Congo; *L. florida*, in Liberia, Angola, and even on the east coast; *L. Kirkii*, on the Zanzibar coast, yielding the best and most abundant rubber, the large trade in which is practically the work of Sir John Kirk during the last twenty years; and *L. Petersiana*, an inferior species, on the east coast. The finest Liberian rubber is the produce of *Ficus Vogelii*, and other species of fig no doubt yield some of the rubbers from both coasts. Some Senegambian rubber is the produce of the apocynaceous climber *Vahea senegalensis*, and Madagascar rubber, which is exported to France, is obtained from *V. madagascariensis*, *V. comorensis*, and *V. gummifera*. The allied *Willughbeia edulis* occurs in Madagascar, Mauritius, and Silhet. Assam rubber, at present the most important of those of Asia, is the product of *Ficus elastica*, which is so well known in the windows of London boarding-houses, requiring, as it does, but little attention. In its native country it enjoys a moist climate, with a shade temperature reaching 98° F. The tapping and collecting are very carelessly performed, so that there is often 35 per cent. of impurities; but the cultivation of the tree has been begun. Java rubber may be the produce of the same species; and that from Rangoon, of an allied form, *F. hispida*; but all the rubbers of the Malay Peninsula and of Borneo would seem to be obtained from various species of Apocynaceæ, such as *Willughbeia Burbiidgei*, "Manungan pulau," *W. Treacheri*, "Bertabu," *Leuconotis eugenifolius*, "Manungan bujok," *Chilocarpus viridis*, and *C. flavescens*. Fiji rubber comes from *Alstonia plumosa*, another member of this order, other species of which yield rubber in the Malay Archipelago.

The use of indiarubber by the natives of Hayti is mentioned by Herrera in his account of Columbus's

second voyage; but the trees were first described by La Condamine from Ecuador in 1735 and by Aublet from Cayenne in 1755. About 1770 Priestly, in a work on perspective, alludes to it as a new discovery for "wiping from paper the marks of a black-lead pencil." Not till the beginning of the 19th century was it used in Europe for waterproofing fabrics, and the importation received an enormous stimulus about the middle of the century from the discovery that by combination with sulphur at a high temperature rubber may be hardened or "vulcanised." Over-vulcanisation with about 40 per cent. of sulphur produces "ebonite" (q.v.), and the admixture of vermilion produces the "dental rubber" used for making artificial gums. Seamless rubber tubing is now largely made by forcing the rubber through a die, or is moulded in powdered French chalk. Sheets of rubber are vulcanised between wet cloths, and retain an impression of them; but fabrics are "waterproofed" by a solution of rubber in benzol. So infinite are the applications of rubber in its various forms that it is, perhaps, hardly a matter of surprise that, in spite of the many plants and countries from which it is now obtained, the demand exceeds the supply, and we are anxiously seeking new sources of the raw material and an increased yield by careful cultivation and collection. [CAOUTCHOUC. RUBBER.]

Indicator Diagrams, in steam- and gas-engines, are curves drawn mechanically, to show the varying pressure of the steam or gas in the working cylinder throughout the stroke. The instrument by which the curve is drawn is called the *indicator*; it was first employed by Watt, and has been of great value in testing the efficiency of engines and in pointing out defects of arrangement. It consists of a small, strong, hollow cylinder fitted with a piston. This has a piston-rod passing through a cover, and the lower end of the cylinder is put in communication with one end of the steam-cylinder itself by means of a brass or copper tube. Thus, the small piston is subjected on one side to the varying pressure of the steam in the main cylinder. To prevent its immediate passage to the end of its short stroke, the further side of the piston is fitted with a strong spring, of which the exact pressure requisite for each inch of compression is accurately determined. The end of the piston-rod thus jerks up and down with a motion corresponding exactly to the variations in steam-pressure during each stroke, excepting in so far as oscillations of the indicator spring mask the true movements required. Connected with the end of the piston-rod, and capable of magnifying its movements by means of suitable levers, is a small pencil of lead or other convenient material. It presses lightly against a drum, round which a sheet of paper is fixed; the drum is made to oscillate about its axis with a motion corresponding to that of the piston of the main cylinder. If the drum be disconnected from the engine, the recording pencil simply marks a vertical line in a jerky fashion. If the indicator cylinder be shut off from the engine and the drum be connected up therewith, the pencil marks a horizontal line round the paper on

the drum. If both mechanisms are connected up, the pencil draws a closed curve for each cycle of pressure-changes on the one side of the main piston. The area of the curve measures to scale the energy supplied by the expanding steam (or gas), and with a knowledge of the number of such strokes per minute the *indicated horse-power* of the engine is calculated.

Indicators, CHEMICAL, in volumetric analysis, are materials which are added to reacting substances to indicate when the reaction is completed. Thus, for example, if the quantity of alkali has to be estimated in a solution, a standard solution of acid is run in until the liquid becomes exactly neutralised, this point being ascertained by an indicator such as *litmus*, which, although of a blue colour in solutions of alkalies, turns red immediately in acid solutions, even though very dilute. The change in colour thus indicates the completion of the reaction, and from the quantity of acid added the quantity of the alkali present is known. Many substances are used as indicators, the mode of use being in all cases essentially similar.

Indices, in *algebra*, signify the power to which a number may be raised. Thus, the cube of a is expressed a^3 , 3 being the index. In the multiplication of two powers of the same number, the resultant power is obtained by adding the indices. Thus, $a^3 \times a^4 = a^7$, a result that may readily be proved. Similarly in the division of one such power by another, the resultant power is the difference between first and second, $a^7 \div a^3 = a^{7-3} = a^4$. From this is derived the rule that quantities with negative indices signify the reciprocals of the same quantities with the corresponding positive indices. Thus, $a^{-7} = \frac{1}{a^7}$ or $a^{-1} = \frac{1}{a}$. To raise a certain

power of a number to another power, the resultant power is given by the product of the first two. Thus, the cube of a^6 is a^{18} . From this is deduced the fact that any root of a given power is obtained by corresponding division of the index. The cube

root of a^9 is a^3 , and the cube root of a , i.e. a^1 , is $a^{\frac{1}{3}}$. In this way a meaning is attached to fractional

indices. The value of $a^{\frac{5}{3}}$ would be the fifth power of the cube root of a . Finally to be consistent, the value of a^0 must be regarded as 1, whatever finite quantity a may be. For $a^m \div a^m = 1$; but $a^m \div a^m = a^{m-m} = a^0$. Hence $a^0 = 1$.

Indic Languages, an expression applied in philology to the Indian branch of the Aryan linguistic family, for which see GAURIAN, ARYAN.

Indictments, CLERKS OF, are officers attached to the Central Criminal Court and to each circuit. They prepare and settle indictments against offenders, and assist the Clerk of Arraigns.

Indigestion (dyspepsia) is a term applied to the group of symptoms consequent upon morbid conditions of the stomach (whether due to disease of that organ itself or produced as a secondary result of mischief affecting other parts of the body).

The term is sometimes restricted to those cases in which gastric symptoms appear to be associated with mere disturbance of the functions of the stomach, apart from any actual lesion or any definitely characterised organic disease. This latter use of the term includes instances in which the food is habitually swallowed without being properly masticated, or in which the amount of food is insufficient or excessive, or when it is of an indigestible character, or when the processes of digestion are interfered with as the result of hurried and irregular ingestion of food. The chief symptoms are a sense of fulness or sinking in the stomach, derangements of appetite, flatulence, nausea, and it may be actual vomiting. In some cases there is a frequent regurgitation of clear fluid from the stomach into the mouth; to this symptom the term *pyrosis* or *waterbrash* is applied. The treatment of indigestion consists mainly in regulating the times of taking food and the kinds of food taken. Attention to the habits of the patient, as regards exercise and the action of the bowels, is often required. Many drugs have been administered with a view to curing dyspepsia—carminatives, mineral acids, alkaline carbonates, vegetable bitters, and ferment substances among others.

Indigo, a valuable blue dye, known as an Indian product from the time of Dioscorides. It is obtained from the leguminous plant *Indigofera tinctoria*, and some allied species, grown in various parts of India, the Philippine Islands, Java, Egypt, Guatemala, Venezuela, Brazil, and Mexico. The plant is a herb, 3 to 5 feet high, with bi-pinnate leaves, and the best indigo—that from Bengal—is prepared from the fresh green stalks and leaves by a process of fermentation in water. The indigo forms a precipitate, and is dried into cakes by pressure. The colouring-matter of indigo, as also of woad (*Isatis tinctoria*) and of lan or Chinese indigo (*Polygonum tinctorium*), is a glucoside known as *indican*, which is decomposed by dilute acids yielding the neutral, tasteless, odourless, insoluble, deep blue *indigotin*, $C_{16}H_{10}N_2O_2$. Indigo is now largely prepared synthetically from cinnamic acid (q.v.), a coal-tar product. This, when acted upon by nitric acid, bromine, and caustic soda, yields nitro-propionic acid ($C_3H_5NO_4$), which, when printed on to cloth with glucose and alkali and steamed, develops indigo in the fabric. Commercial indigo varies greatly in quality, and is often mixed with earthy substances and cheap colouring matters.

Indigo Bird (*Cyanospiza cyanea*), a North American finch, about 5 inches long, with deep blue plumage varied with ultramarine and green. The female is smaller and more soberly clad.

Indium (In. 113.4), a metallic element which occurs to a very small extent associated with zinc in the ores of that metal—e.g., blende—and in which it was discovered by means of the spectroscope. It is a white, soft, malleable metal, melting at 176°C ., and possessing the specific gravity 7.4. It does not tarnish in air, and forms several series of metallic salts, its oxide having the formula In_2O_3 .

Indo-Chinese, collective name of all the south-eastern Asiatic peoples, except the Cambojans, Malays, and Negritoes, who belong ethnically to the Mongolic division of mankind, but who speak numerous languages belonging to a distinct order of speech usually called "Monosyllabic." The peculiar nature of this order has been explained in the article CHINESE LANGUAGE, a typical member of the group, the other chief branches of which are *Tibetan*, *Burmese*, *Talaing (Mon)*, *Thai*, including *Lao*, *Shan*, and *Siamese*; *Annamese* of Tonquin and *Cochin-China*; *Lohita*; *Naga*; *Si-fan*, *Lolo*, *Karen*, *Miao-tze*, and numerous other aborigines of China and Indo-China. For details see under the several entries.

Indo-Germanic, an expression formerly, and sometimes even still, employed, mainly by German writers, as synonymous with Aryan. But it has deservedly fallen into general disuse, being quite inadequate, inasmuch as it leaves out the *Iranic*, *Hellenic*, *Keltic*, *Italic*, and *Slavic* members of that family. [ARYAN RACES AND LANGUAGES.]

Indonesian, a term invented by Logan to designate the non-Malay inhabitants of the Eastern Archipelago, but now used as a convenient collective name for all the races of Malaysia and Polynesia who are neither Malays nor Papuans. Such are the Battaks of North Sumatra, many of the so-called Dyaks of Borneo, most of the natives of Jilolo (Halmahera), and the large brown race of East Polynesia (Samoans, Maori, Tongans, Tahitians, Marquesas Islanders, many Micronesians, and the Hawaiians). Dr. Hamy, who first gave this extension to the word, points out that the Battaks and other pre-Malay peoples of the Eastern Archipelago so closely resemble the Eastern Polynesians that the two groups should be regarded as two branches of an original non-Malay stock. Although all speak dialects of the common Malayo-Polynesian language, the physical type is quite distinct, and rather Caucasian than Mongolic—tall stature (5 feet 10 inches), muscular frame, dolichocephalous skull, rather oval features, high, open forehead, large, straight nose, large eyes horizontally slit, lips moderately projecting, beard often fairly developed, complexion much lighter than the Malay (light cinnamon), long black hair slightly curled or wavy. (Dr. E. T. Hamy, *Bulletin de la Société de Géographie*, xiii., 1877; A. H. Keane, *Relations of the Indo-Chinese and Oceanic Races*, 1880.)

Indore, the name of the state in Central India governed by a Maharajah having the title of Holkar; also of its capital. The total area is about 8,000 square miles, but the districts that go to make it up are scattered about the plateau of Malwa and the basin of the Nerbudda, the Vindhya range irregularly dividing the territory into two portions, of which the southern, watered by the Nerbudda, is the larger and more fertile, yielding wheat and other grains, sugar, cotton, tobacco, and great quantities of opium. Forests of wide extent are found on the Vindhya and Satpura hills. The population consists principally of Mahratta Hindus, and, in the less civilised parts, of primitive Bhils and Gonds.

A branch of the Great Indian Peninsula Railway extends to Indore, which is connected by another line with Nusrabad, Agra, and Delhi. The climate is hot and, after the rainy season, decidedly unhealthy. Education has made some progress, the Rajkumar College for sons of chiefs and nobles being an important institution. An agent of the Governor-General watches over the administration of this and the neighbouring states of Central India, having his headquarters at the capital, which stands on the left bank of the Kuthi, and is rather a poor city of brick and mud houses, with a granite palace for the Maharajah and a fine British Residency. The Holkar dynasty, founded at the close of the 18th century by Mulhar Rao, has been since 1843 under the virtual protection of the British, who placed the reigning sovereign on the throne, and who maintain strong garrisons at Mhow and Mahidpur.

Indra, in Hindu mythology, one of the chief gods of the Vedic triad, corresponding in many points to Zeus or Jupiter of classical theogonies. He personifies the firmament, is the lord of heaven, the giver of light and rain, the controller of storms and clouds. In later ages he passes into a less important position. He is generally represented as young and handsome, riding on an elephant, and he is often depicted as possessing numbers of eyes.

Indre, the name of a department, a river, and a town of France. The first covers an area of 2,624 square miles between the departments of Indre-et-Loire and Loire-et-Cher to the N., Cher to the E., Vienne and Indre-et-Loire to the W., and Creuse, Haute-Vienne, and Vienne to the S. Sloping from N. to S., the surface consists of a tableland only broken by hills at its lower extremity. Two-thirds of the country are covered with scattered woods, where cattle and horses are bred in numbers; but tillage only prospers in the river valleys. Fruit, beet, colza, potatoes, and garden produce are plentiful, but the vine does not thrive. Iron, limestone, marble, lithographic stone, and granite are worked profitably, and there are manufactories of paper, woollen fabrics, pottery, and tobacco. Châteauroux is the capital, Le Blanc, Issoudun, and Le Châtre being towns of some importance. The river from which it takes its name flows through the department from S.E. to N.W., receiving on its way the Creuse, Claise, and Vienne, and joining the Loire between Tours and Saumur. The town of Indre is situated in Loire-Inférieure, five miles W. of Nantes, and is only remarkable for extensive ironworks.

Indre-et-Loire, a department of France, bounded by Sarthe and Loire-et-Cher N., Maine-et-Loire W., Indre and Loire-et-Cher E., and Vienne S. and S.W. It has an area of 2,360 square miles, two-thirds of which are remarkably fertile. The Varenne, which includes the valleys of the Loire and Cher, and the Véron, lying between the Loire and Vienne, are the richest districts. The slopes of the Champeigne that separate the Cher from the Indre are noted for wine. The Gâtine, the Brenne, and the Sainte Maure have a less favourable reputation. The valley of the Loire is called "the

garden of France," and by its fertility, beauty, and climate deserves the title. Cereals, fruit (especially plums), vines, roots, hemp, nuts, and vegetables are produced abundantly. The *métayer* system does not, however, tend to promote agriculture. Good pastures are scarce. The mineral resources include iron, marble, building-stones, and marl, but do not add much to the general wealth. Pottery of good quality is made in various places, and the silkworm is cultivated with success. There are large gunpowder works at Ripant. Tours is the capital, and chief among many smaller towns are Chinon and Loches.

Induction, in *statical electricity*, signifies the appearance of electricity of one kind on the surface of separation of a dielectric and a conducting substance, when electricity of the opposite kind has been isolated. It is impossible to produce one without the other; when a charged body is introduced into a room, the inner walls have the opposite charge distributed over them, the density of the induced charge at any point depending upon the shape of the charged body, the intensity of its charge, its distance from the enclosure, and the shape of the enclosure. The dielectric between these opposite charges is in a stressed condition, for their tendency is to combine. When a rubbed piece of ebonite is held near a few shreds of light paper, the charge in the ebonite causes the induced charge in the neighbouring substances to be practically concentrated in the nearest of these, *i.e.* in the shreds of paper. The tendency of the opposite charges to unite will cause the paper to attach itself to the ebonite and so discharge itself. It then falls, the residual charge on the ebonite causes a further flow of electricity into the paper, and the process is repeated though with less vigour.

In *magnetism* the term has a somewhat different significance. The medium surrounding a magnet is in a strained condition, and at every point there is a definite direction of the resultant force; the existence of this force is not apparent unless a magnetic substance, such as iron, be brought to the given point. When any such substance is thus introduced into the medium, the lines of force are altered in direction, and the intensity of the force is changed. This rearrangement of the condition of the medium by reason of the introduction of a magnetic substance is called *magnetic induction*. [MAGNETISM.] In *electro-magnetism* it is found that variation in the arrangement of the lines of induction in the medium surrounding a magnet is capable of producing electric currents in any closed conducting circuits, through which the varying lines of induction may pass. If, for example, a bar magnet be thrust through a closed coil of wire, a current will be found to pass round the coil. The strength of this *induced* current depends on the number of windings in the coil, their diameter, and their resistance, on the strength of the inserted magnet, and the time taken to thrust it into the coil. Inasmuch as lines of induction may be produced by an electric circuit precisely similar to those produced by a magnet, it follows that variation in the strength of current flowing in one circuit

will cause intermittent currents to exhibit themselves in any neighbouring circuit. This fact has wide-reaching applications in modern electrical engineering. [DYNAMO-ELECTRICAL MACHINERY.]

The *Ruhmkorff Induction Coil* exhibits the action of one current on another very clearly. A low-resistance coil of few turns is wound round a core of soft iron, generally made up of a bundle of fine iron wires. Surrounding this, but entirely insulated electrically, is another coil of wire finer than the first, of many thousands of turns and much higher resistance in consequence. A current obtained from a few cells is sent through the low resistance or *primary* coil for a small fraction of a second and then stopped. This starting and stopping is rendered continuous by a trembler mechanism similar to that used in ordinary trembler electric bells (q.v.) for the same purpose. This variation in the current induces an alternation of potential in the high resistance or *secondary* circuit, in which the actual current strength will average much less than in the primary, but the intensity of potential much greater. [VACUUM TUBES.]

Indulines include a number of compounds all closely related to one another in their chemical characters and composition. They are employed as dyes yielding blue colours of great range of depth and shade, and are in the majority of cases rich in colour and stable compounds. Their exact chemical constitution has not, however, been certainly determined.

Indus, one of the largest rivers of India, rises in the Kailas Mountain among the Himalayas (32° N. lat. and 81° E. long.), where the Sutlej also has its source, and after a course of 1,800 miles, during which it descends 18,000 feet and drains an area of 373,000 square miles, falls into the Arabian Sea by several mouths S.E. of Karachi. It is first known as Sinhkabad, and, flowing N.W. past Ladak for 160 miles, enters Kashmir. The Hindu Kush range is passed at an altitude of 14,000 feet by the tremendous gorge of Iskardoh, and then, flowing S.W. through Kohistan, the river enters the Punjab at Derbend. Near Attock it is joined by the Cabul river, and from this point turns almost due S., parallel to the Suleiman range. At Mithunkote it receives the vast volume of water which the Panjad has collected from the five rivers of the Punjab, and from this point its breadth is increased to 2,000 yards, or even to several miles in seasons of flood. It enters Sind at 28° 26' N. lat., and soon after spreads into several branches, the chief being to the W., where a delta of 3,000 square miles is formed. The Indus is shallow, the depth in places not exceeding 5 feet, and is much obstructed by sands and rocks, besides being liable to floods in March and September; but the navigation has of late years been vastly improved, and steamers ply regularly up to Sukkur.

Indusium, a luxuriant growth from the leaf in some ferns (q.v.), covering more or less completely the sorus or cluster of sporangia. In *Nephrodium* it is a kidney-shaped epidermal structure, but it may be several cells thick, and even have stomata.

In *Hymenophyllæ* it is a marginal cup-shaped structure, and in *Lygodiæ* a similar one envelops each separate sporangium. In many species of *Pteris* and other genera a *false indusium* is produced by the rolling back of the margin of the leaf.

Inertia, the property of all matter by reason of which it tends to remain in the same state of rest or motion. To alter the speed or the direction of motion of any mass requires, therefore, the exertion of force, and it is only by the recognition of the expenditure of force that we form our conception of inertia. [DYNAMICS, MATTER.]

Infanticide, the term used by anthropologists to denote the custom among races of low culture of destroying children as a means of lessening the severity of the struggle for existence. According to Darwin (*Descent of Man*, ch. xx.), wherever the practice prevails the struggle will be in so far less severe, and all the members of the tribe will have an almost equally good chance of rearing their few surviving children. In most cases a larger number of female than of male infants are destroyed, for it is obvious that the latter are of more value to the tribe, as they will, when grown up, aid in defending it, and support themselves. On the other hand, the custom has been attributed to a desire on the part of the women to retain their comeliness. Probably various motives led to the adoption of this custom; even religion may have had some share therein, as it undoubtedly had in the case of some of the hill tribes of India, and in many cases its perpetuation may have been due to the feeling—akin to that of some modern juries—that the killing of a child is a small crime in comparison with the killing of an adult. The exposure and killing of infants practised in classic times hardly comes under the head of infanticide as anthropologists understand the term; for though sometimes employed as a check to population, the object was usually to prevent the bringing up of sickly or malformed children. But in ancient Greece and Rome the father had absolute power over his children, and decided whether their lot should be freedom or slavery, life or death. Ellis records how prevalent the practice was when he arrived in Polynesia, and says that he could not find a woman who had not killed at least one child. In India the custom lingered till quite recent times, and its practice among the Todas having naturally led to polyandry, induced Colonel Marshall to come to the conclusion that the ancient Britons, who were undoubtedly polyandrous (*De Bello Gal.*, v. 14), were also infanticidal.

Infants. An infant is strictly one under 21 years of age, which is, generally speaking, the age of "legal capacity." In certain purposes, however, it is reached much earlier, for in criminal cases a person of the age of 14 years may be capitally punished, but under the age of 7 years he cannot. As to the intermediate period (that is, between these respective ages), there is much uncertainty, the accused being *primâ facie* innocent. Yet if he could discern between right and wrong, he may be convicted and undergo execution, though he had not attained the age of puberty or discretion. A

male at 12 years old may take the oath of allegiance, at 14 is so far at years of discretion that he may enter into a binding contract of marriage, and at 21 he is at his own disposal, may alien his property, and generally perform all the duties and enjoy all the privileges of a citizen. A female is of maturity when 12 years old, and may therefore at that age enter into a binding contract of marriage, and at 21 may dispose of her property. The full age of 21 years is completed on the day preceding the anniversary of anyone's birth, and as the law allows no fraction of a day in computing time, it follows that if an infant is born on the 1st of January, he or she is of age to perform any legal act on the morning of the last day in December, though he or she may have lived nearly 48 hours or two days short of the 21 years.

Infection. Certain diseases are transmissible from person to person, the healthy person being affected through the medium of some infective material or *contagium* given off from the sick. Such diseases are said to be infectious or contagious (the latter term being sometimes limited to cases in which the disease is transmitted by direct contact). The development of the germ theory has led to the notion that the essence of infection is a living organism, and in some instances it appears clear that such organisms have been demonstrated to exist, and the group of organisms known as *fission fungi*, popularly known as *bacteria*, has had particular attention directed to it in this connection. The means by which infection is conveyed are various; thus, the sputum of phthisical patients is probably largely responsible for the transmission of consumption. The scales of epidermis from the desquamating skin are supposed to be a medium of infection in scarlet fever. The breath is probably infective in measles, whooping cough, and other diseases; the mucus from the throat in diphtheria; and there can be little doubt that the excreta from the bowels are the means of conveying infection in cholera and typhoid fever. In some diseases infection is produced by inoculation only, *e.g.* *vaccinia*, and this is the common means of transmission in other diseases, such as anthrax. When infected material is conveyed into the body of a susceptible person, there ensues a period of incubation of variable length in different diseases, from a few hours or days in the case of diphtheria to as much as three weeks in mumps; in other diseases a yet longer incubative period obtains, and in cases of hydrophobia an incubation period extending even to months is said to occur.

The incubative period is succeeded by a period of invasion, usually accompanied by symptoms of fever; and in the case of the eruptive fevers or *exanthemata*, after a time fairly constant in the case of each particular disease, the characteristic rash appears. During the course of the illness the *contagium* undergoes development within the body, but after a time, unless death occurs, this development comes to an end, and the *contagium* is destroyed. It is usual to consider that a patient remains infectious for about three weeks after an attack of measles or diphtheria, and for six weeks

after scarlet fever. In some cases, however, these periods of contagiousness must be extended, as, for example, in cases of scarlet fever where desquamation is protracted. The Infectious Diseases Notification Act of 1889 is now in force in most parts of the country, and requires the notification of small-pox, cholera, diphtheria, membranous croup, erysipelas, scarlet fever, typhus, enteric (or typhoid fever), continued fever, relapsing fever, and puerperal fever. Power is given to a sanitary authority, with the sanction of the Local Government Board, to include any other infectious disease within the scope of the Act.

Infinitesimal Calculus, the branch of mathematics that deals with infinitely small quantities. Its chief divisions are the differential and integral calculus. [CALCULUS.]

Infinity, in *mathematics* (represented by the sign ∞), is a most difficult conception, and if used carelessly is liable to lead to fallacies. Numerically infinity signifies not one number but any number too great to be appreciated directly or indirectly by any means at our disposal. If $ab = ac$, it is usual to infer that $b = c$, but this is not the case if $a = \infty$; for, so far as our senses can distinguish, there is no difference between different multiples of infinity. Similarly, in geometry, an infinitely distant point means such a one as cannot be compared in position with any point in finite space. Two lines are called parallel when they are in the same plane, and when no amount of continuation of the lines will bring them together. Yet if they actually met at an infinitely distant point, they would still be parallel through the range of finite space. A circle of infinitely large radius would coincide with a straight line, from which the idea springs that if we could travel along a straight line sufficiently far we should return to the starting point.

Inflammation is the reaction manifested by the tissues to injury. The classical signs of inflammation are redness, swelling, heat, and pain. The arteries supplying an inflamed part dilate, and the flow of blood in them is retarded; fluid escapes from the capillaries involved in the inflammatory processes. [EXUDATION FLUID.] White blood corpuscles make their way through the capillary walls, and proliferation of these cells or of the connective tissue cells of the affected parts occurs. Such formation of new cells, if excessive, may result in suppuration, or the formation of pus, the pus corpuscles being the degenerate descendants of proliferating cells. Inflammation may terminate in resolution with absorption of the inflammatory products, or such resolution may be complicated by suppuration and the formation of abscesses, or by ulceration where the parts affected lie superficially. When the inflammation is severe, it may involve the death of considerable portions of tissue (gangrene or necrosis). The cause of inflammation may be some mechanical injury, or the introduction of some chemical irritant, or an infective agent or organism.

Inflorescence, a special region of the plant among seed-bearing plants, which bears the flowers

and has a special method of branching of its own. It generally also bears special leaves, besides those within the flower, which are known as *bracts* (q.v.). If these are absent, as in the *Cruciferae* (q.v.), the inflorescence is termed *ebracteate*. The branch or axis bearing a whole inflorescence is termed a *peduncle*, which may be unbranched, as in the tulip. If branched, its branches are known as *secondary* or *tertiary peduncles*, etc.; but the ultimate branches that terminate in the flowers are called *pedicels*. An inflorescence rising direct from an underground stem with few or no leaves upon it is termed a *scape* (q.v.), as in the tulip, hyacinth, or *Primula*. Inflorescences of more than one flower are divided into three classes, according to the order in which their flower-buds develop—viz., *racemose* or *indefinite*, *cymose* or *definite*, and *mixed*. [BRANCHING.] In the first class the lower or outer flowers open first; the terminal bud last. In the second class the terminal bud or centre flower opens first. In a mixed inflorescence one order of branching is racemose in its development and another cymose—e.g. the primary branches of one type, the secondary ones of the other. If the peduncle only bears one order of branches, the inflorescence is termed *simple*; if more than one, *compound*. Compound inflorescences may be *homogeneous*, if their secondary system of branching is precisely like the primary—e.g. a spike of spikes or an umbel of umbels; or *heterogeneous*, when, though belonging to the same main class (and therefore not “mixed”), the two systems are unlike—e.g. an umbel of spikes. Racemose inflorescences may have their main axis or peduncle either elongated or arrested, and in either case the individual flowers may be sessile or stalked (*pedicellate*). This gives us four main types—the *spike* (q.v.), with elongated axis and sessile flowers; the *raceme* (q.v.), with elongated axis and pedicellate flowers; the *capitulum* (q.v.) or “head,” with an abbreviated peduncle and sessile flowers; and the *umbel* (q.v.), with abbreviated peduncle but pedicellate flowers. Nearly all definite inflorescences are termed *cymes* (q.v.), and most of the chief modifications of the inflorescence, such as the catkin, spadix, corymb, and panicle, in addition to those already mentioned, are separately described. Mixed inflorescences are more complex. That of the horse-chestnut is a *raceme of cical cymes*, the primary branching being racemose, the secondary cical. In many *Labiatae* we have a *spike of verticillasters*; in chicory, a *bostrychoid cyme of capitula*; and in *Cineraria*, a *corymbose cyme of capitula*.

Influence Machines, in *electricity*, are machines for the separation of electricity on a large scale. The best known is the Wimshurst machine, which works on the principle of electric induction. It consists of two circular plates of glass or ebonite placed close together and made to rotate in opposite directions on the same axis. On the outer face of each plate small radial discs of tinfoil are fixed, in number from ten to eighteen usually. Tracing the course of one such disc suffices to explain the course of all. It has at one moment a small positive charge, and induces a negative charge on the

disc facing it and passing round on the opposite plate in the reverse direction. After performing this induction the given disc discharges itself into one receiver by means of a small metallic brush, and, travelling round further, is charged negatively by induction from a disc on the other plate. It then does duty in acting inductively for the production of a positive charge, and is then discharged into a receiver that collects the negative charges. Being then charged positively, it is in the primary condition of the cycle of changes, and the process is repeated. Positive charges accumulate on one receiver, and negative charges on the other. [ELECTRICITY.]

Influenza is an infectious disease, in which catarrh of the respiratory mucous membranes is a marked symptom. It is developed in epidemic form from time to time, attacking a large proportion of the population, and producing a marked influence upon the death-rate. Since the registration of deaths was systematically undertaken in this country, no year has passed in which deaths from influenza have not been recorded; but the disease in its epidemic form has occurred only two or three times. There was an outbreak in 1837-38, 1847-48, and 1889-90-91-95-99, 1903. Little is known about the causation of the malady; it is highly infectious, and is presumably a germ disease. The symptoms are prostration, with severe frontal headache, and pains in the back and limbs; there may be considerable elevation of temperature, and pain in the eyeballs is often a characteristic early symptom. After a short interval the mucous membranes of the respiratory tract become involved, with sneezing, sore throat, bronchitis, or even pneumonia. The disease is usually at its height on the third day, convalescence is frequently protracted, and complications are not uncommon. The percentage of deaths is small, but so many people are attacked that not a few fatal cases occur. During epidemics the number of deaths recorded from diseases of the respiratory organs is materially augmented. Adult males are particularly liable to be attacked by influenza and to suffer severely; but the disease is chiefly fatal in the case of old persons, especially in those who are the subjects of chronic lung mischief. The treatment is that of febrile maladies generally. The remarkable prostration seems to indicate the desirability of adopting a liberal regimen. It cannot be too strongly insisted upon that there is danger in endeavouring to disregard this disease. Many deaths have occurred in persons who refuse to “lie up” and adopt reasonable precautions.

In Formâ Pauperis. Anyone may now be admitted to sue or defend as a pauper on proof that he or she is not worth £25 apart from clothes and the subject-matter of the action; but a case must first be laid before counsel for his opinion, whether or not there are reasonable grounds for proceeding, and the case and opinion, with an affidavit by the party or his solicitor of the truth of the facts stated, must be produced to the court. When admitted to sue or defend as a pauper, the court may assign him, if necessary, a counsel, a

solicitor, or both, who may not refuse without good reason, and are bound to act gratis.

Information, CRIMINAL, is a complaint exhibited before the King's Bench Division of the High Court of Justice against anyone for some misdemeanour. It differs from an indictment mainly in that the latter is found by the oath of a grand jury, whereas an information is simply the allegation of the person exhibiting it. Informations are of two kinds—(1) those partly at the suit of the sovereign and partly at that of a subject; and (2) those which are in the name of the sovereign only and are filed by his own immediate officer, the Attorney-General. Informations of the former kind are usually exhibited under penal statutes, which impose some penalty on the offender should he be convicted (one part of which goes to the sovereign, the other to the informer).

Infrutescence or INFRUTESCENCE, a botanical term bearing the same relation to fruit (q.v.) as inflorescence (q.v.) does to flower. It is especially applied to structures in which the fruits produced by several flowers (generally a whole inflorescence) are closely united, often together with peduncular or other structures which are at all events not gynæcial. In the mulberry tree (q.v.) the perianth-leaves become fleshy, enclose the small dry capsule, and, touching those of the other flowers, a whole raceme forms one berry-like infrutescence. In the fig (q.v.) we have a hollow urn-shaped capitulum (q.v.) with a fleshy peduncle, which becomes sweet and ripens like a fruit and encloses numerous florets succeeded by round capsules, the "pips." The pine-apple is mainly a fleshy branch surmounted by a tuft of leaves, and having the dried-up perianth-leaves of numerous spirally arranged flowers on its outer surface. These are among the most striking examples.

Infusions, preparations obtained by steeping vegetable substances usually in hot water and straining, the heat in no case being allowed to reach the boiling-point, as is the case with decoctions. The pharmacopœia contains infusions made from calumba, cinchona, gentian, kusso, quassia, and other substances.

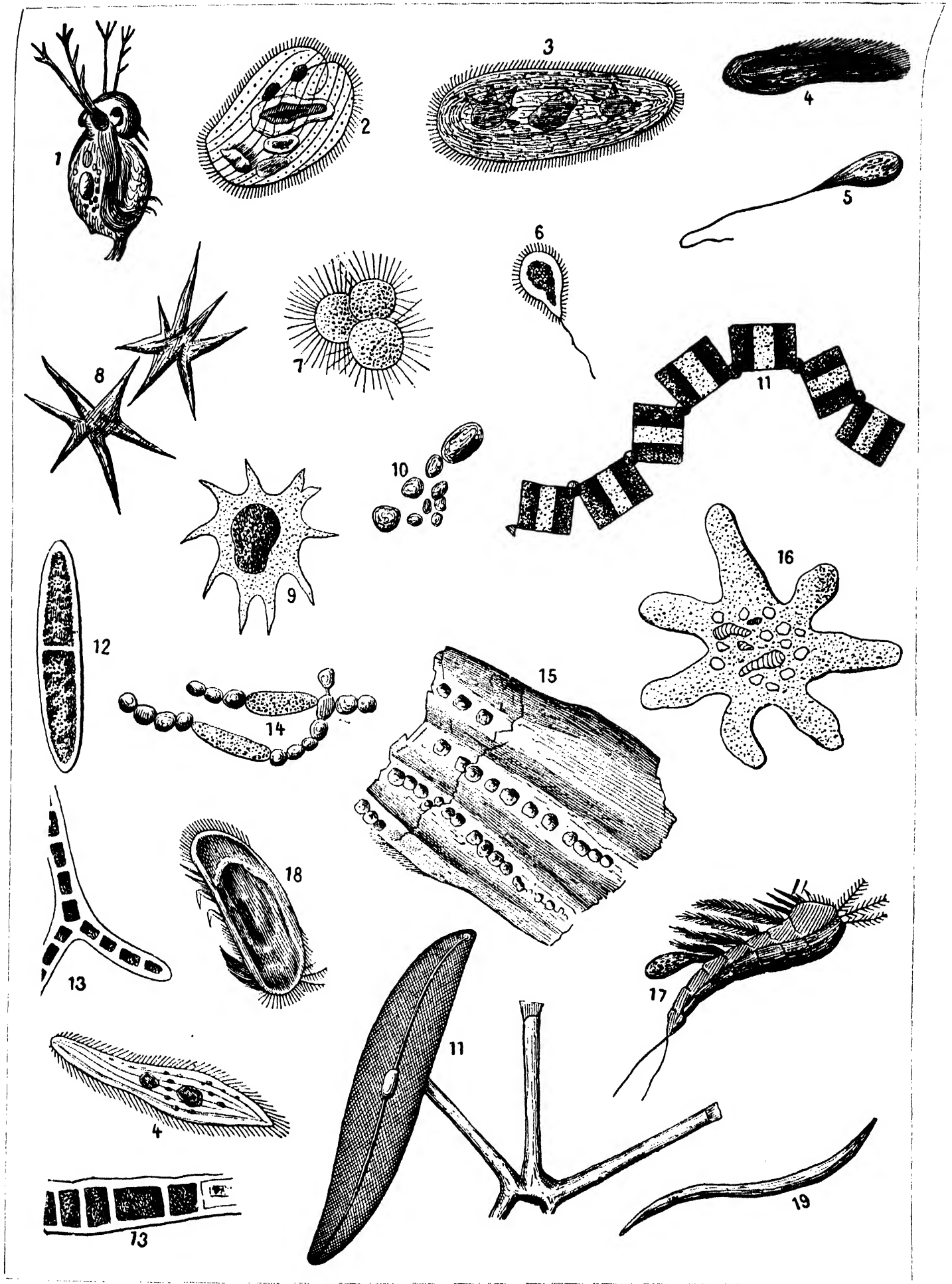
Infusoria, a class of Protozoa (q.v.) which includes the most specialised members of this phylum. The class is characterised by having a stable outline, as they do not emit pseudopodia (cf. *Amœba*), but have a more or less complete investment of the small vibratile processes known as cilia. They usually have a mouth (cytostome) and an anus (cytopyge). The body is often divided into two layers—the exoplasm (or cortex) and endoplasm (or medulla). A contractile vacuole (q.v.) is nearly always present. The nucleus is either single or multiple. They are mostly microscopic in size, but the compound forms may be fairly large. They are nearly all free-swimming, and live in either salt or fresh water; a few live in a small gelatinous tube or lorica, while others are attached by small pseudopodial processes (e.g. *Stentor*). The only skeletal structures known are that the lorica of some species contains particles of

silica (as in *Cordinella*), while in a few it is more specialised, consisting of a siliceous tube perforated by minute pores, which give it a radiolarian (q.v.) aspect. There are four orders of Infusoria, mainly characterised by the disposition of the cilia. They are—(1) Holotricha, in which the cilia are of the same form and occur in parallel lines; (2) Heterotricha, in which there is an investment of fine cilia, while there is also one band of larger processes known as "membranellæ," which are formed of many fused cilia; (3) Hypotricha, in which the cilia occur only on the ventral side; and (4) Peritricha, in which there is one band of membranellæ, but (with the exception of *Trichodinopsis*) there are no cilia. The Infusoria occur in great abundance in most rivers, ponds, and the sea, but they are only doubtfully known in a fossil condition. It should be remembered that the term Infusoria is often used in a more general sense to include also all the Mastigophora (q.v.).

Ingelow, MISS JEAN, was born at Boston, Lincolnshire, in 1820. In 1850 she published anonymously *A Rhyming Chronicle of Incidents and Feelings*, and in 1851 followed a narrative poem, *Allerton and Dreux*. Her first success was with a volume of verses published in 1863, and since then she issued several volumes, which ran through many editions. Towards 1865 she began to write simple stories for children, and her *Home Thoughts and Home Scenes*, *Mopsa the Fairy*, *Little Wonderhorn*, and *Story of Doom*, have found much favour. Still later she produced several novels of high merit, *Off the Skelligs*, *Fated to be Free*, *Don John*, and *Sarah de Berenger* being the best known. She died in 1897.

Ingemann, BERNHARD SEVERIN, was born at Torkildstrup, Denmark, in 1799, and was being educated at the university of Copenhagen when the bombardment of 1806 took place, and his boyish compositions perished in the flames. However, in 1811 he produced a volume of poems, and repeated the experiment with success in the two following years. His cyclical romance, *The Black Knight* (1814), established his reputation, and he next made an essay in the drama with *Masaniello*, *Bianca*, *The Voice in the Desert*, and *The Shepherd of Toluca*. His fame, however, rests mainly on his historical novels, *Valdemar Seier*, *Erik Menved's Childhood*, *King Erik*, *Prince Otto of Denmark*, and many others, modelled upon the example of Scott. He was appointed professor of literature, and subsequently director of Sörö College, and died in 1862.

Ingleby, CLEMENT MANSFIELD, born at Edgbaston, Birmingham, in 1823, graduated at Trinity College, Cambridge, and became a solicitor. His reputation rests upon his labours as a Shakespearian scholar, as testified by about a dozen works, beginning with *The Shakespeare Fabrications* in 1859, and ending with an edition of *Cymbeline* published in the year of his death, 1886. One of the best known of his volumes is entitled *Shakespearian Hermeneutics*. He was a trustee of Shakespeare's birthplace, a vice-president of the New Shakespeare Society, and an honorary member of the Shakespeare Society of Weimar.



INFUSORIA.

(Sediment of Water from the Thames.)

1 Daphnia pulex. 2 Chilodon. 3 Paramecium. 4 Acineria incurvata. 5 Paranema globulosa. 6 Cercomonas.

Ingolstadt, or INGOLDSTADT (ancient AUREA-TUM or CHRYSOPOLIS), is a fortified town in Upper Bavaria on the left bank of the Danube, about fifty miles north of Munich. Starting as a royal villa in the 9th century, the place received a charter in 1312, and became the capital of a dukedom, which subsequently fell to the Bavarian Crown. The fortifications built in the 16th century stood many assaults, in one of which, led by Gustavus Adolphus, Tilly was killed. Moreau razed the defences to the ground in 1800, but they have since been reconstructed on the scale of a first-class fortress. The streets are well laid out, and there are, besides the usual institutions of a provincial capital, the Gothic Dome founded in 1425, the old ducal castle, and the buildings of the university now transferred to Munich.

Ingres, JEAN DOMINIQUE AUGUSTE, was born at Montauban in 1780, and as a child showed great musical capabilities, but at the age of twelve developed a still stronger taste for painting. David took him as a pupil, and in 1801 he carried off the *Grand Prix*. *The Bather*, one of his best works, was produced in 1802, and he executed fine portraits of Napoleon both as First Consul and Emperor. From 1804 to 1824 he lived in Rome or Florence, and to this period belong his *Edipus and the Sphinx*, *Jupiter and Thetis*, *Virgil Reading the Æneid*, *Raphael and the Fornarina*, *Death of Leonardo*, *Grande Odalisque*, and many other fine paintings, including portraits. His genius, however, standing as it did half-way between the classical and romantic schools, was not fully recognised in France until 1824, when *The Vow of Louis XIII.* obtained his election to the Institute. He now returned to Paris, but went back to Rome as director of the French school there after ten years. Several fine works, but especially the *Stratonice*, won him so much praise that he came home once more in 1841, and continued to work till the day of his death in 1867.

Ingulph, or INGULPHUS, born about 1030 of English parents, entered a monastic order, and having become secretary to William the Conqueror before his invasion of England settled in Normandy. In 1085 he was brought over to take charge of the Abbey of Croyland, where he remained until his death in 1109, doing much to enlarge and improve the foundation. The *Historia Monasterii Croylandensis*, once believed to have been his work, is now generally attributed to a later scribe, and its historical value has much depreciated.

Inhabited-House Duty comes under the denomination of "assessed taxes," and is a duty assessed and imposed upon persons in respect of the houses they inhabit. It is usually collected with the income-tax.

Inia (*Inia geoffrensis*), the Amazon Dolphin, a toothed cetacean of the family Platanistidæ, and the sole species of its genus. It is about eight feet long, bluish above, pale flesh colour below, and is found in the Amazon and its tributaries.

Injector, in engineering, is a contrivance for forcing a liquid through an orifice by means of the

flow of another stream of fluid through a small jet concentric with the orifice. The most ingenious is Giffard's injector for pumping water into a steam boiler by means of a jet of steam from the same boiler. Though it would at first seem impossible for the steam to overcome the opposing pressure of the water from the same boiler, the paradox disappears when the fact is considered that the steam is condensed into water at the jet. The energy thus liberated is converted into kinetic energy of the fluid through the jet, and outflow of the boiler water is prevented.

Ink. The term "ink" may be applied to any liquid which can be employed for writing upon paper or other fabric, leaving after drying a more or less permanent and indelible record. Such liquids have been used for many centuries, but accurate information regarding the composition of ancient inks is but scanty, so that little is definitely known. They were probably, however, similar to our present Indian ink. It is convenient to divide inks into those employed for *writing* and those used for *printing*. Of the former black is the colour chiefly used, and the ordinary black writing-ink is composed essentially of a compound of *iron* and *gallic acid*, which is held in suspension in a thin gum solution. It is prepared by thoroughly macerating *nutgalls* with hot water and then adding to the decoction a solution of *copperas*, together with the quantity of gum necessary to give the liquid the required consistency. As proportions the following may be taken:—Nutmalls, 12 lb.; copperas, 5 lb.; Senegal gum, 5 lb.; water to 12 gallons. In many inks *logwood* or *indigo* is also added, the latter being used in most of the blue-black inks, which, though blue at first, quickly dry to a deep black colour. Other materials have been employed and different inks produced not containing the above materials, but have enjoyed little popularity. For *red ink* a decoction of *Brazil wood*, to which a small quantity of chloride of tin has been added, is usually employed. Solutions of *cochineal* or of *carmine* may also be used, but the writing with these compounds is not of as permanent a nature as with the former substance. *Blue ink* is best made by dissolving Prussian blue in a solution of oxalic acid, the pigment being first purified by treatment with a mineral acid—e.g. hydrochloric acid. Inks of other colours may also be prepared by the use of suitable dyes, the so-called aniline colours being well adapted for the purpose. *Copying-inks*, by means of which copies of the writing may be taken on a damp sheet of paper pressed upon it, are prepared from ordinary writing-inks by the addition of sugar, gum, or other such substance. *Marking-ink*, used for production on linen of writing which can withstand washing, is usually prepared by the solution of the nitrate or tartrate of silver in ammonia, together with a little gum to give consistency. A colouring material is also usually added, but the indelible writing is entirely due to the decomposition of the silver salt. Numerous chemicals are also employed for the formation of *sympathetic inks*, in which the characters only become visible after the application of some process

to the writing. Thus a solution of sugar of lead (lead acetate) yields writing which becomes visible if treated with sulphuretted hydrogen. By use of solutions of cobalt salts, drawings, etc., may be obtained in which the markings, etc., become green on warming, but again invisible on cooling; and these compounds are used in production of the so-called chameleon pictures. A solution of nutgalls, if used as ink, becomes visible if treated with a solution of copperas, and many other means may be adopted for similar purposes. *Printing-inks*, not being used in the same manner as writing-inks, require totally different properties. Thus, while they do not require to flow as easily, they should dry more rapidly, and not be affected, or to but a small extent, by water, etc. What is found best adapted for printing purposes is a thick, drying oil into which is thoroughly mixed lampblack, or, if coloured inks are desired, any other permanent pigment. The oil usually employed is linseed oil. It is first boiled and allowed partially to burn; sliced soap and a quantity of powdered resin are added and well stirred, after which the still warm liquid is poured over the lampblack, to which a little indigo may be added, and thoroughly stirred and mixed before being allowed to cool. For coloured printing-inks the manufacture is essentially similar, but other pigments, as vermilion, Prussian blue, yellow ochre, etc., are employed. *Lithographic inks* are also prepared from lampblack mixed up with shellac, soap, wax, tallow, and gum solutions; while most of the so-called *indelible inks* consist of the same pigment suspended in a suitable medium. [INDIAN INK.]

Inkbag, the name of a gland in many of the Cephalopoda, such as the Pen-and-Ink Fish or Squid and the Octopus, which secretes a black sepia pigment. By means of this the animal discolours the water around it so that it is hidden from an opponent. The inkbag has been found with the sepia still in perfect condition in some of the fossil Jurassic Cephalopods.

Innes, Cosmo (1798-1874), advocate, historian, and antiquary, born at the old manor-house of Durris, on Deeside, son of the Laird of Lenchars, was a sedulous contributor to the publications of the Bannatyne, Maitland, and Spalding Societies, editing many old cartularies. In 1840 he served as sheriff of Moray, and being in 1846 elected to the (then unpaid) chair of history at Edinburgh, proved a successful lecturer, and wrote a valuable work on early Scotch history.

Innes, Louis (1651-1738), was the principal (appointed 1682) of the Scotch College in Paris when James II. and his son were exiles in France. In 1714 he resigned his post, and became almoner to the ex-queen, and Secretary of State to the Chevalier de St. George. He is supposed to have compiled the memoirs of James II., of which an abstract by Dr. Clarke, who ascribed them to Louis' brother, **Thomas Innes** (1662-1744), appeared in 1816.

Innocent III., POPE (1161-1216), Lothario, Count of Segni, member of the great house of Conti, born at Anagni. He gained great reputation during

his studies at Rome, Paris, and Bologna; and on the death of Celestine III., during whose reign he composed his great work, *De Contemptu Mundi, sive de Miseria Humanæ Conditionis*, was, at the early age of thirty-seven, proposed as Pope by Cardinal John of Salerno, who had refused the pontificate, and at once unanimously elected. Innocent speedily became the great champion of the temporal power and the ascendancy of the Papacy. His erudition and diplomatic skill, combined with a remarkable genius for gaining and maintaining power, enabled him to humiliate the imperial prefect of Rome, and to drive the imperial seneschal, Duke Markwald of Romagna, out of the Mark of Ancona, and to wrest the duchy of Spoleto from Duke Conrad, thus, and by skilful diplomacy, gaining possession of the "States of the Church." He secured the kingdom of Naples, as guardian of the young King Frederick (afterwards the Emperor Frederick II.), against the designs of Markwald. In 1198 he established the inquisitorial tribunals which were the germs of the Inquisition. In 1200 he excommunicated Philip Augustus, King of France, and laid his kingdom under an interdict; in 1209 he crowned his nominee, Otto IV. (of Brunswick), emperor at Rome, the murder of Philip of Swabia having delivered Otto and the Pope from a disastrous war; and in 1212 deposed King John of England, after having excommunicated him and laid England under an interdict. The Pope at this time dominated the greater part of Western Europe. In 1215 he held a great council, the fourth Lateran, of 1,300 prelates and ambassadors, by which the dogmas of transubstantiation and the obligation of auricular confession were promulgated, the Pope's *protégé*, Frederick, was acknowledged as Emperor of Germany on his promising to conduct a crusade (the fifth), the Franciscan and Dominican orders were confirmed, and severe decrees against heretics and Jews were issued. The crusade against the Albigenses which Innocent organised (1209) has tarnished the memory of this heroic pontiff, while his free use of the terrible instruments of excommunication and interdict suggests that his nature inclined towards cruelty. Of blameless life himself, he made strenuous efforts for the reform of morals in the Church.

Innocent XI., POPE (1611-89), Benedict Odescalchi, born at Como, after serving as a soldier became a priest, and on the death of Clement X. (1676) was elected Pope. He was distinguished for his efforts to reform the administration and the morals of the Papal court, and for his opposition to the Jesuits. Louis XIV. quarrelled with him for abolishing the sanctuary allowed in the privileged quarters round the residences of some ambassadors in Rome, with the result that Papal pretensions received a severe check in France, and that the Pope preferred the cause of William of Orange to that of Louis' *protégé*, James II.

Innominate. The artery of that name is a branch of the ascending aorta. The innominate bone is the name given to the pelvis.

Innsbruck, the capital of Tyrol, lat. 47° 16' 18" N.; long. 11° 23' 53" E., stands 1,754 feet above the

sea-level, on the River Inn. It contains fine churches, some of which are famous for works of art, the general school for all Tyrol, and the university, besides some remarkable bronze statues of the 16th century, and has extensive suburbs. The Hofkirche contains the tombs of Maximilian I. and Hofer. The Provincial Government or Diet for Tyrol has its seat here, as also the Assembly of Estates, established 1816.

Inns of Court (*Hospitia curiæ*). The Societies of the Middle Temple, Inner Temple, Lincoln's Inn, and Gray's Inn are so called because the students therein study the law to fit them for practising in the Law Courts. These, together with the Inns of Chancery and the two Serjeants' Inns, are said to have formed one of the most famous universities in the world for the study of laws, and here exercises were performed, lectures read, and degrees conferred in the Common Law, as they are at other universities in the present day in the Canon and Civil Laws. The degrees were those of barristers (first styled apprentices, from *apprendre*, to learn), who answered to our bachelors as the style and degree of a serjeant (now abolished) did to that of doctor. These studies are now under the control of the Council of Legal Education, who have endeavoured to re-invigorate them by holding out rewards for excellence in the various branches of legal study, and particularly in Roman law and jurisprudence, and by making a certain standard of excellence compulsory upon all students seeking admission as barristers. The Inns of Chancery, Clifford's Inn, Symond's Inn, Clement's Inn, and others are subordinate to the Inns of Court properly so termed.

Inoceramus, a genus of bivalved mollusca (or Lamellibranchiata), of which the shells are common in the English chalk.

Inoculation. It was at one time a common practice to inoculate small-pox, with a view to producing the disease in a mild form, and protect the system against a subsequent attack of a severer form of the malady. Such inoculation was introduced into England early in the 18th century by Lady Mary Wortley Montagu, who was made familiar with the practice in Constantinople, to which place it was introduced from the East. The discovery of vaccination led to the gradual extinction of inoculation, and in 1840 the latter proceeding was prohibited by law.

Inoperculata, a term applied to the Gastropoda (q.v.), of the order Pulmonata, in which the animal is not provided with an operculum or lid, for the closure of the shell. Thus, among our English snails all belong to this order except the one species of *Cyclostoma*.

Inosite, a compound of composition $C_6H_{12}O_6$, which occurs in leguminous plants and also in the muscles of the heart, the lungs, and other parts of the human body. It forms colourless rhombic crystals, soluble in water and possessing a sweet taste. Its chemical reactions indicate that the substance is related to benzene (q.v.), being hexahydroxy hexahydrobenzene $C_6H_6(OH)_6$.

Inquest (*Inquisitio*), an inquiry by a jury

duly empanelled by the sheriff or other lawful authority in any cause, civil or criminal. The term inquest is sometimes used to signify the jury itself, before whom the question is brought. [CORONER.]

Insanity. The term insanity as popularly understood is commonly held to include those forms of mental derangement which are accompanied by such loss of self-control as to constitute the patient a danger to himself or others, and to make it desirable that he should be subjected to some form of restraint. The term is not ordinarily held to include the delirium met with in fever, or as the result of alcohol, or hysterical conditions. The symptoms may be classified under three heads—*sensory*, *motor*, and *intellectual*. Under sensory symptoms hallucinations and illusions may be especially referred to. An illusion may be described as a perverted sense impression, while in hallucination sense impressions are created in the organs of sense apart from any actual exciting cause from without; the patient hears voices, sees objects, or detects odours, which have no existence outside his own consciousness. Among motor symptoms, conditions of spasm or paralysis may be present; in general paralysis of the insane, phenomena of the latter kind play an important part in the development of the disease. The symptoms of disturbance of intellect are very various; the despondency of melancholia and the restless excitement of mania, moral perversion, the existence of delusions, and suicidal or homicidal tendencies represent some of the most common kinds of mental alienation. The chief forms of insanity are as follows:—

Melancholia. In this condition mental depression is the characteristic symptom; it is often associated with defective powers of digestion and sleeplessness; sensation is commonly impaired; hallucinations are often present. Delusions (possibly associated with ideas of religion) may occur, and a tendency to suicide is common. Melancholia attornita or melancholia with stupor is a peculiar variety of this form of insanity. Melancholia may end in recovery, or become chronic and finally pass into a condition of dementia; it may precede or follow mania.

Mania. In mania there is excitement as opposed to the depression of melancholia. The patient is noisy and restless, his memory is usually very defective, and he often proceeds from one train of thought to another with that rapidity and aimlessness of transition which is characteristic of *incoherence*. There may be complete recovery from the condition, or the mania may become chronic, the patient chattering incessantly and his mental condition steadily degenerating. In some cases mania forms part of what is called *folie circulaire*, in which condition mania is succeeded by melancholia, which in its turn gives place to a further development of the maniacal condition, and so on.

Monomania. In monomania the characteristic symptom is the presence of fixed delusions, often relating to the exalted condition of the patient or to his being persecuted by imaginary foes.

Dementia is the condition of mindlessness to which all chronic forms of insanity gradually tend. It may be developed primarily and apart from the conditions of mania or melancholia. The characteristic symptom of dementia is the *loss* of mental and moral qualities rather than their perversion. There is marked loss of memory, the delusions developed in the primary attack of insanity often persist, and hallucinations are common. The weak-mindedness of idiocy and the manner in which it differs from dementia have been discussed under that head. [IDIOCY.]

General paralysis of the insane is a form of insanity which stands quite apart from the other varieties; it is much more common in men than in women, and usually attacks subjects in the prime of life. Paralysis is a marked phenomenon, and is associated with tremor; speech is affected in a characteristic manner; the pupils are often unequal; and the patellar reflex may be lost. The mental symptoms often assume the form of what is known as grandiose delusion, the patient imagining himself to be possessed of certain qualities or attributes to a preposterously exaggerated degree. General paralysis is a disease which always proceeds from bad to worse; it usually runs its course in the space of about three years, and in its final stages the patient is reduced to a condition of complete helplessness.

Causes of Insanity. Among the predisposing causes of insanity the existence of an hereditary tendency to nervous instability is perhaps the most important. Nationality does not appear to play a very important part in the matter, and as regards sex there is no marked difference in the incidence of the disease on males and females. General paralysis, however, affects men far more frequently than women, while women are specially liable to develop insanity in connection with the period of child-bearing.

As regards exciting causes, intemperance, certain chronic forms of disease affecting the nervous system, and the association of attacks of insanity with pregnancy, labour, and lactation may be alluded to. Patients sometimes become insane during the period of convalescence from acute febrile diseases, and certain chronic affections such as phthisis have distinct relationships with insanity.

The treatment of insanity is directed mainly on the lines of securing quiet for the mind just as rest is enjoined in the case of an injured limb. Change of associations is often beneficial, and such restraint as may be necessary must be judiciously exercised. A great improvement has been brought about within recent years in the treatment of pauper lunatics; the victim of insanity is no longer regarded as a malefactor to be chastened into a return to normal conditions, but as a patient demanding systematic and scientific treatment.

A person for whom restraint is deemed necessary is placed under certificates—that is to say, he is certified to be insane by two medical men, and an order for his admission to an asylum is obtained. In cases where questions of the disposal of property are concerned, the much more elaborate procedure of an inquiry by a "Master in Lunacy" is resorted to.

The licensing and inspection of public and private

asylums, control in matters relating to certificates of insanity, regulations concerning the admission of patients, etc., are vested in a body known as the Commissioners in Lunacy.

Insect-fertilisation. [FLOWER.]

Insectivora, an order of mammals, containing numerous small, generally nocturnal forms, of which the Shrews, Moles, and Hedgehogs offer familiar examples. They are very widely distributed, and constitute two sub-orders: (1) *Insectivora Vera* (True Insectivores), with free limbs, adapted for running, climbing, burrowing, or swimming, and (2) *Dermoptera* (with claims to ordinal rank) having the limbs united by a membrane. [FLYING LEMURS.] The diet of most consists of insects, frogs, lizards, mice, etc., but one form (*Potamogale*) lives on fish and *Galeopithecus* on fruit.

Insectivorous Plants. [CARNIVOROUS PLANTS.]

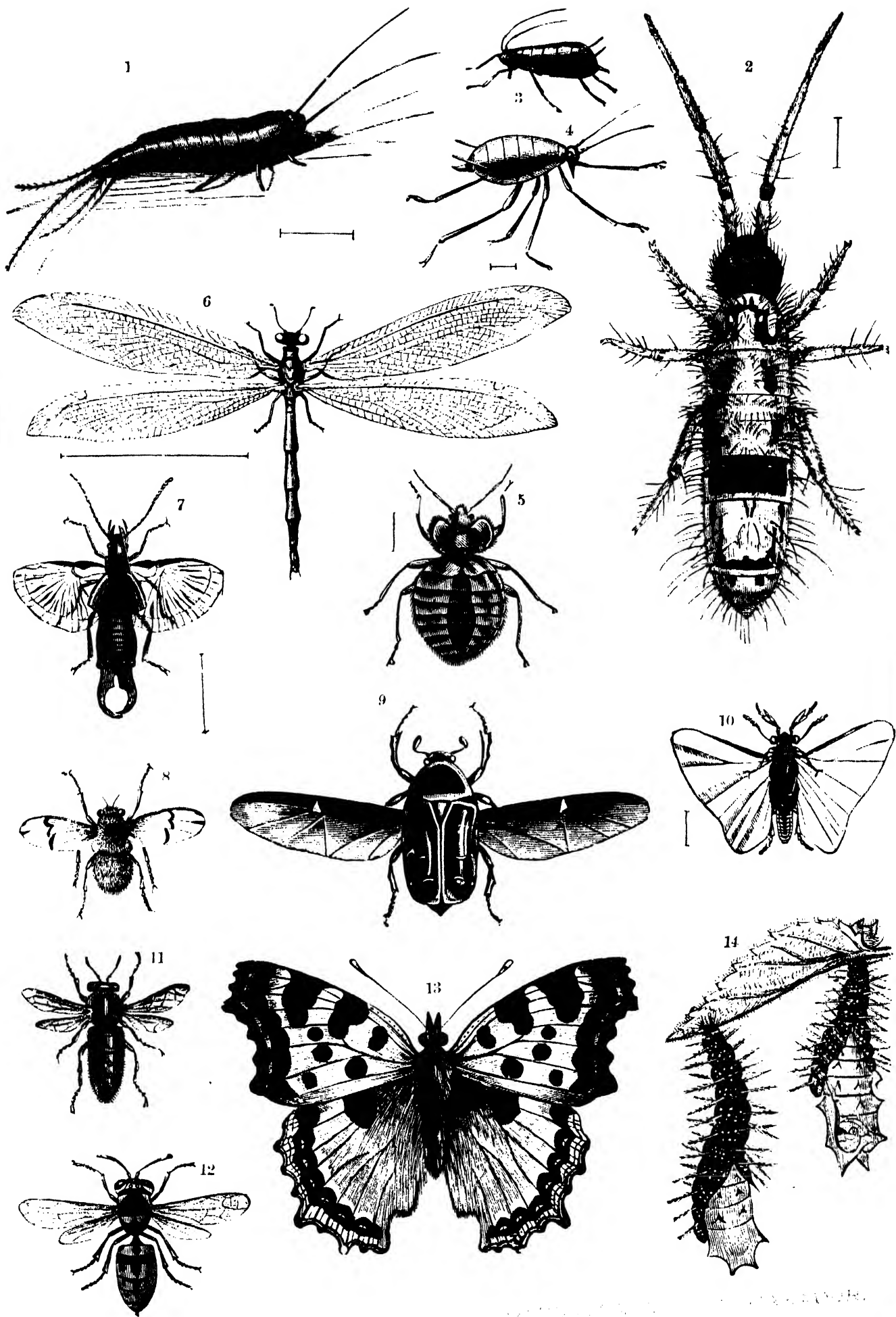
Insects are the members of the best known class of all the Arthropoda (q.v.). They belong to the subdivision of this phylum known as the Tracheata, because they breathe by means of a series of internal air passages known as tracheæ, which ramify through the tissues. The body is divided into three regions—head, thorax, and abdomen, each of which consists of a series of rings more or less fused together. The thorax bears three pairs of legs and the wings, of which there are usually two pairs. The head carries a pair of antennæ or feelers, which are very varied in form. The main function is that of touch, but they may also act as organs of hearing or smell.

Nearly all insects pass through a metamorphosis or series of stages, which are very different in appearance: thus, after being hatched from the egg, they usually occur as the worm-like caterpillar, then as the fixed, quiescent stage of the chrysalis or pupa, from which emerges the imago or perfect insect. But any of the intermediate stages may be skipped: thus, the egg stage is missed in some beetles, in which the young are born as caterpillars; such are said to be "viviparous." In some flies both the egg and caterpillar stages are wanting, and the young are born as pupæ; these are known as "pupiparous." In some plant lice, etc., the young exactly resemble the adults, and there is no metamorphosis. In some few cases, on the other hand, there is an additional stage introduced as in *Mantispa*; these are said to show hypermetamorphosis.

The metamorphosis is *complete* when a resting or chrysalis stage intervenes between the caterpillar and adult, as happens in butterflies; these are known as "holometabolous." Or the metamorphosis may be *incomplete* when the pupa is active, so that the three stages are not sharply marked off; these are either ametabolous, in which the larvæ are like the adults, or hemimetabolous, when it undergoes considerable change.

Parthenogenesis (q.v.) and *dimorphism* are both well illustrated and common among insects.

The appendages are the most striking features of the insects. In most cases the adults have three



INSECTS.

- 1 THYSANURA: *Hepisma Saccharina* (Spring-tail). 2 THYSANURA: *Orchesella cineta*. 3 and 4 HEMIPTERA: Wingless aphides or plant lice, male and female. 5 HETEROPTERA: *Acanthia lectularia* (Common bed bug). 6 NEUROPTERA: *Mormonella formicaria* (Ant lion). 7 ORTHOPTERA: *Eurygaster australis* (Common sawfly). 8 DIPTERA: *Phaenocarpa*. 9 COLEOPTERA: *Carabus*. 10 DIPTERA: *Phaenocarpa*. 11 DIPTERA: *Phaenocarpa*. 12 DIPTERA: *Phaenocarpa*. 13 LEPIDOPTERA: *Pieris*. 14 LEPIDOPTERA: *Pieris* caterpillar and pupa.

pairs of legs and two pairs of wings. Both of the latter may be used for flight, or they may be alike as in the Homoptera (q.v.), different as in the Hemiptera, etc.; or only one pair may be used for flying, the anterior pair serving to protect the more delicate posterior pair; or the posterior pair may be rudimentary as in flies. In some insects the wings are absent, and in one group (*apterygogenea*) (q.v.) no wings were present even in the ancestors. The legs in the adult are usually six in number, and each consists of five joints, known as the coxæ or hips, trochanters, femora (thighs), tibiæ (shanks), and tarsi (or feet). The number of legs may be reduced as in the Fritillaries. In the caterpillars there are also a series of claspers or prolegs, which vary in number from 10 to 22. In some cases there are rudiments of true legs on the abdomen, such as the cercopoda (q.v.) of the Orthoptera. The remaining appendages on the abdomen are not true legs; the principal one is the ovipositor, which in many cases also acts as the sting (e.g. in Wasps). Neither are the antennæ true limbs as they are in the crabs. The appendages of the mouth vary considerably in different orders, according to whether the insect feeds by sucking or biting.

The nervous system consists of a series of ganglia connected by a cord along the ventral side of the body; one ganglion (or a fused pair) occurs above the œsophagus, and is united to the main chain by a nerve on each side of the œsophagus. In the imago the nervous system is more concentrated, and the primitive arrangement can be seen best in the caterpillar. A sympathetic system is also present, and controls the opening of the breathing pores or stigmata.

The sense organs are well developed; there is usually a pair of compound eyes and often a few additional simple eyes or ocelli. In some, such as fleas, *Collembola* (q.v.), etc., only ocelli are present. Many of the parasitic species are blind. Many insects can detect the ultra-violet rays, which are invisible to the human eye. The sense of smell is often very keen, but they have but a dull appreciation of pain.

The circulatory system is fairly simple, and consists typically of a long vessel along the back.

The digestive system is usually complex, but is imperfect in many of those which have a very short life. Thus, in the larvæ of *Dytiscus* and *Ephemera* there is no mouth, and the animal gains its food by suction through its perforated jaws (or mandibles); in some the stomach ends blindly, as in the larvæ of many Hymenoptera; in others there is no digestive system at all, as in the *Phylloxera*.

The renal or excretory organs (nephridia) may be few as in butterflies, or numerous as in ants. This character is of great value in classification. Silk glands (sericteria) occur in many insects, notably the silkworms.

Respiration is very important, and is effected by tracheæ of very various forms. They usually consist of minute tubes ramifying through the body and opening to the exterior by a series of pores, known as spiracles or stigmata; as a rule there are none on the head, but some occur there in a few *Collembola* (q.v.) and some *Lepidoptera* larva. In

some insects (known as apneurtic) the tracheal system is closed, as in the Mayflies and the larvæ of *Dytiscus*, and the respiration is then effected by the walls of the rectum. In other cases there are outgrowths of the tracheæ known as "tracheal gills" (q.v.).

The insects are probably always bisexual, the only exceptions being due to malformation.

There are probably about 250,000 described species of insects, and the classification of this great multitude is necessarily complex. The most recent is that of Brauer, based on the embryology and the characters of the nephridia; but the older and simpler classification is here adopted in the main:—

Class I.—APTERYGOGENEA:—

Collembola (springtails).
Thysanura.

Class II.—PTERYGOGENEA:—

1. Orthoptera (locusts, etc).
2. Neuroptera (dragon-flies).
3. Strepsiptera.
4. Rhynchota Hemiptera (plant lice).
Heteroptera (bugs).
5. Diptera (flies).
6. Lepidoptera (butterflies and moths)
7. Coleoptera (beetles).
8. Hymenoptera (ants, wasps, etc.).

Insects are not common as fossils, except in amber, resins, and some plant beds. Most of the existing orders begin in the Lias or Trias, but the Apterygogenea are not known before the Oligocene. In the Palæozoic (q.v.) there are four extinct orders, the Orthopteroidea including the Silurian *Palæoblattina douvillei*, Br., the oldest known insect. The Neuropteroidea includes one Devonian species, the rest of it and the whole of the Hemipteroidea being very abundant in the Carboniferous. The richest fossil insect faunas in England occur in the Jurassic limestone.

Insertion, the relation of the floral leaves to the receptacular portion of the flower (q.v.). The calyx (q.v.) is termed *inferior* if not adherent to the ovary; *superior* if adherent, whilst the ovary is known conversely as *superior* in the former case and as *inferior* in the latter. The corolla (q.v.) is either *hypogynous* (q.v.), *perigynous* (q.v.), or *epigynous* (q.v.), according as the receptacle retains the primitive tapering form of an ordinary shoot, or is expanded above into a disc or cup round (but free from) the ovary, or is adherent to it. The stamens (q.v.) are generally described as having the same insertion as the corolla; but in gamopetalous or gamophyllous flowers a zone of intercalary growth has sometimes carried both petals or perianth-leaves and stamens up on a tube, which, though truly common to both, is termed a corolla-tube or perianth-tube. The stamens are then termed *epipetalous*, as in the hypogynous primrose and in the epigynous Compositæ, or *epiphyllous*, as in the hypogynous hyacinth and in the epigynous iris. Insertion is a character of very great importance in classification.

Insessores, a lapsed order of birds. [CORACOMORPHÆ.]

Instantaneous Centre, in any moving mechanism, means the point at any given instant that is for the moment motionless. A wheel rolling

along the ground has one point in contact with the ground. This point is for the moment held motionless, and thus acts as the instantaneous centre, the rest of the wheel swinging round it.

Insulation. In *electricity* it is usual to classify substances according to their ability to conduct electricity, or, in other words, according to their power to resist the stress caused by the separation of opposite electrifications. There is no line of separation between conductors and insulators, but if good insulation is demanded substances such as air, glass, paraffin, ebonite, shellac, or porcelain are selected. Thus the insulation material for an ordinary Leyden jar is glass; to prevent leakage from a telegraph-wire to the ground through the telegraph-posts, insulators of porcelain are used. The covering of submarine cables is of gutta-percha or some such compound, strengthened by an outer casing of wire rope. The insulation for ordinary alternating currents is generally of the above nature also; but for high potential and high frequency alternations it seems that ordinary insulators are liable to break down, small flaws rapidly increasing in size, even though at first they may not be detected. To avoid this, oil insulation has been proposed; being fluid, its tendency is to correct any flaws that may momentarily appear.

Insulators. [INSULATION.]

Integripalliata, a group of bivalved mollusca belonging to the class Lamellibranchiata. It includes those forms in which the line of the attachment of the mantle or pallium is not indented by a notch, due to the impression of the muscles, which retract the long respiratory siphon. [ANODON.]

Intensification. In the production of a photographic negative [PHOTOGRAPHY] or transparency it frequently happens that the developed image, though exhibiting all the detail of the picture, has not sufficient *density*, or is not opaque enough, to be useful for its required purpose. It may then be rendered denser or more opaque by some of the numerous methods of *intensification* in vogue among photographers. The simplest, and that most commonly adopted, is probably an intensification by means of mercuric chloride (corrosive sublimate HgCl_2). The negative is placed in a solution of this salt until the whole image becomes completely whitened owing to the union of the mercuric chloride with the silver of the image. It is then well washed by water to get rid of the excess of the mercury salt, and placed in a dilute solution of ammonia, by the action of which the whitened salt is again blackened, giving a far denser and more opaque image than the original. Other modes of treating the whitened image may also be adopted, or intensification may be effected by other *intensifiers*, as lead or uranium salts; but for details of various processes reference should be made to books on photography.

Interest, payment for the use of money; it may be either *simple* or *compound*. Simple interest is that arising from the principal only; compound, that paid on the principal and the interest as it falls due, and if unpaid, it is added to the principal.

Interference, in physics, signifies the neutralisation of waves by their coalition when not in the same phase (q.v.). If one wave combines with another of the same amplitude and wave-length, but just half a wave-length ahead of the first, the crest of the one is neutralised by the trough of the other, and *vice versa*. The result is that no displacement is witnessed at their combination. This may be most readily apprehended in the case of waves of water, though the generalisations on interference are applicable also to sound-waves in air or to light or electric waves in ether. If the two waves combine when in the same phase, the resultant is a wave of double amplitude. This effect is visible at the Niagara River Rapids, where waves reflected from the sides of the gorge unite at the middle of the stream and cause that portion to be considerably higher than the sides. Interference in sound-waves may be exhibited by sounding together two consecutive notes on a harmonium, differing only by a semitone. Here the waves are of slightly different length, and at regular intervals one is nearly quenched by the other, the phenomenon of *beats* being produced. Beats may be more readily noticed in clanging bells, which are apt to give out notes very near each other in wave-length and frequency. Closely analogous to beats in acoustics is the phenomenon of twinkling stars in optics. From the same distant source of light two waves may be regarded as passing to the eye of the observer. If they had passed through identically the same medium, they would arrive in the same phase and so combine; but occasionally one wave is slightly retarded, and arrives in a condition to neutralise the other. Assuming white light to come from the star, it may thus happen that the red rays are for a moment extinguished and the remaining rays give the colour to the star. Thus in the case of a star like Sirius, light interference causes it to change colour continually; smaller stars having much less brilliancy appear to go out entirely. Diffraction (q.v.) is due entirely to interference, which is also the fundamental reason for the colours presented when crystals are seen by polarised light, when a soap-bubble is viewed in sunlight, or when a piece of plane glass is pressed upon a slightly convex glass surface.

Interlaken, or INTERLACHEN, a beautifully situated village in the canton of Berne, Switzerland, in the Boedeli valley, near the Aar on the left bank, "between the lakes" of Thun and Brienz. It is a very popular resort for tourists and visitors, especially English and American. One of its attractions is a fine old castle.

Intermittent Fever. [AGUE.]

Internode, that part of a stem that intervenes between two *nodes* or points at which successive leaves are given off. Internodes are fairly well seen in the fresh-water alga *Batrachospermum*. In Characeæ, as in not a few higher plants, there is a marked difference in the internal structure of nodes and internodes. In most grasses the nodes are solid, but the internodes hollow. In most flowers, in buds, on the dwarf-shoots of larch and cedar, or

in plants with rosettes of leaves, the internodes are very slightly elongated; but in some bamboos each internode reaches a length of several feet.

Interpolation, in mathematics, is a useful process of obtaining approximately a number corresponding to a given quantity when the two numbers corresponding to two other such quantities are known. Thus, if the average height of a person 15 years old be known, and also that of a person 16 years old, it is a simple matter to calculate approximately the average height for an age of 15½ years. The one assumption in this case is that the growth during the year is uniform. On this one assumption much interpolation is effected in mathematics, such as the calculation of the cosine (q.v.) of an angle of 23° 16' 5" when the cosines of 23° 16' and of 23° 17' are known; or the calculation of the logarithm (q.v.) of the number 62174 when that of 62170 and 62180 are known. By graphical methods the process may be extended considerably, even when the variation of the one quantity is not proportionate.

Intestacy occurs when a person dies without making a will. As to his real estate, *see* DESCENT. As to his personal estate, the disposition of it is regulated by the "Statute of Distributions," the principal one being the 22 and 23 Charles II., c. 10.

Intestine. [DIGESTION.]

Intussusception. By this term is meant the folding of one portion of bowel into an adjoining portion; its occurrence is usually productive of intestinal obstruction, and (the blood supply to the infolded portion of bowel being cut off) gangrene and sloughing may occur. The disease sometimes affects young children, but is otherwise very rare. Operative treatment is sometimes needed; the condition is in all cases of serious import.

Inulin, a substance of the group known as *Carbohydrates* (q.v.), which in many respects closely resembles starch. It occurs in the roots of the dahlia and other plants, and forms a white powder insoluble in cold, forming a mucilage with hot water. By boiling with dilute acids it is completely converted into fruit-sugar or levulose. It is distinguished from starch by giving a brown instead of a blue coloration with an iodine solution.

Inventory, a schedule or detailed statement containing a true description of goods and chattels or furniture, etc., made upon a sale or by an executor or administrator of a deceased person.

Inverness, capital of the Highlands of Scotland and of the county of Inverness-shire, is situated on the south coast of the Moray Firth near the mouth of the river Ness, which divides the town into two parts, the southern being the most populous and important. Vessels of 200 tons burden can lie alongside the quay of the harbour. The handsome modern town has grown up within the last hundred years.

Investiture, the delivery of corporeal possession. It is now more particularly applicable to the

temporal part of a benefice, as the term "institution" is to the spiritual. And when a clerk is presented, instituted, and inducted into a living, he is then, and not before, invested with full and complete possession. In mediæval times it was a constant subject of dispute between temporal and spiritual authorities. In Feudal Law it was the delivery of possession of land granted by a lord to his tenant, and corresponded to the more modern term livery of seisin. Investiture is also one of the formalities by which the election of a bishop is confirmed by the archbishop of the province. The term also applies to a grant of honour or dignity, *e.g.* the investiture of anyone with the Order of the Garter.

Invocation, the act of calling up a spirit, or the formula employed. [FAUST.]

Involucre, a whorl of bracts (q.v.) below an inflorescence. In the globe artichoke (*Cynara Scolymus*) it is the succulent bases of the bracts of the involucre that are eaten. Smaller secondary involucre terminating secondary peduncles, as in the compound umbels of many Umbelliferae, are known as *involucels*.

Involute, "rolled inwards," a term applied to leaves having their margins rolled in over their upper surfaces, as in the sticky insect-catching leaves of the butterwort, or in those of the violet, or in the case of many petals. In geometry it is a curve derived from another, termed its *evolute* (q.v.), by what may be called a process of unwinding. Taking the simplest case, that of a circle as *evolute*, if we regard a thread as being wound round a circle, the curve traced out by its free extremity when unwound is the *involute* of the circle. In any other curve there is a corresponding *involute*, which is definable as that curve which possesses the property that the length of the tangent drawn from any point on it to the original *evolute* is equal to the length of the *evolute* between the tangent point and the point of commencement of the *involute*. The *involute* of a cycloid is an equal *cycloid*; that of a circle is the ordinary *spiral*; that of the catenary is a *tractrix*.

Involution, in mathematics, signifies the raising of a number to any required power. To cube a number, for example, is a process of involution. The opposite process, that of obtaining any root of a number, is called *evolution*.

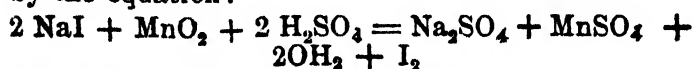
Iodates. [IODIC ACID.]

Iodic Acid has the composition of HIO_3 , and forms transparent six-sided crystals soluble in water. It may be prepared by the action of nitric acid upon iodine, and by other chemical reactions. It forms well-defined salts, called *iodates*, of which the greater number are insoluble. Sodium iodate frequently occurs associated with *Chili saltpetre* (q.v.), and on this account the acid is sometimes found as an impurity in nitric acid prepared from this source. Neither the acid nor its salt are of any great practical importance.

Iodides are the salts of *Hydriodic Acid* (q.v.), *i.e.* are hydriodic acid in which the hydrogen has been replaced by a metal, or equivalent group of

elements. Of these the most important is potassium iodide, which is very largely employed for chemical and other purposes, while many iodides are used to a great extent in medicine and photography. Other compounds of iodine with elements other than metals are also termed iodides, as, *e.g.*, iodide of phosphorus, etc.

Iodine is a non-metallic elementary substance possessing the atomic weight 127 and represented by the symbol I. It was discovered at the beginning of the 19th century by the chemist Courtois in the seaweed *kelp*, and this substance has ever since formed an important, and was for a long time the only, source of the element. It occurs to a small extent in many minerals, plants, and a number of spring waters, usually combined with potassium, calcium, or magnesium. From the *kelp* it is prepared by thoroughly macerating the burnt seaweed with water and allowing the solution obtained to crystallise. Many salts separate out, but the iodides being very soluble remain in solution. The liquid thus obtained is placed in large iron stills, and sulphuric acid and manganese dioxide are added. The stills are heated, and iodine passes over and condenses in a series of condensers attached to the stills. The reaction is represented by the equation :



It is afterwards cured by resubliming.

As thus obtained iodine is a dark grey opaque shining solid, which crystallises in rhombic prisms. It gives off vapours at ordinary temperatures, and readily if heated; the vapour is of a very fine purple colour, and possesses a very high density, being $8\frac{1}{2}$ times heavier than air. It possesses an odour resembling somewhat, but not so disagreeable as that of, chlorine or bromine, which are closely allied elements. [HALOGENS.] The solid melts at 113° , and possesses a specific gravity of 4.9. It is slightly soluble in water, and readily in alcohol, chloroform, carbon disulphide, or a solution of potassium iodide. Even in very minute quantities it gives a remarkably fine blue coloration with starch solution, by which means it can be readily detected. Both free and in its various compounds iodine is of very extensive use for scientific and industrial purposes. In the chemical laboratory it finds innumerable applications for many purposes; large quantities are employed in the manufacture of the aniline dyes; in photography it is very extensively used, chiefly as the silver salt; but by far the greatest quantity is required for medicinal purposes. In medicine it is used in preparation of tinctures, liniments, etc., for external application, and for medicinal draughts, either in inorganic combination, as iodides of potassium, sodium, lead, arsenic, mercury, etc., or in organic compounds as ethyl iodide, iodal, iodoform, etc. [See also HALOGENS.]

Iodoform, a compound of composition CHI_3 ; *i.e.* similar to chloroform (*q.v.*) with the substitution of iodine for the chlorine; which is obtained by the action of potash upon alcohol or acetone. It forms yellow crystals of the hexagonal system,

is soluble in water, and possesses a saffron-like odour. If warmed with carbolic acid and potash, a red coloration is obtained, and this forms a convenient method of testing for the compound. It is much used in surgery for its antiseptic properties. There are two preparations in the pharmacopœia—the suppository and the ointment. Iodoform wool and iodoform gauze are employed in the treatment of wounds, and iodoform powder is often dusted over ulcerated surfaces. When used in excessive quantities the substance has been absorbed freely, and has been known to produce severe constitutional symptoms.

Ion, in electrolysis, is the name given to the product deposited at either terminal of the electrolytic cell. With the ordinary conventions for the direction of flow of a current of electricity (*q.v.*) the product deposited at the terminal where the current enters is called the *anion*, and that at the terminal where the current leaves is called the *kathion*.

Iona, or ICOLMKILL, the first seat of Christianity in Britain, is a small island of the Hebrides group. It was originally a seat of the Druids, who were in 565 converted or expelled by St. Colomb. It is three miles long and one broad, and belongs to the parish of Ross in Mull.

Ionian, the name of the central portion of the west coast of Asia Minor, bounded by the Hermus on the north and the Mæander on the south, which was colonised by Ionian Greeks, said to have migrated under Androcles and Neleus about B.C. 1050. The chief cities of the Ionian confederacy were Miletus, Chios, Samos, and Ephesus, and later, Smyrna, its limits extending to the islands and the adjacent districts. The chief sanctuary of the league was the Panionium on the north side of the promontory of Mycale. The cities of Ionia were subdued by the Lydians under Cræsus, and fell with Lydia under the Persian yoke. Their unsuccessful revolt (B.C. 500–496) led to the invasions of Greece by Darius and Xerxes. After the repulse of the latter they regained independence for a time (B.C. 469–387). After the conquest of Alexander the Great, Ionia formed part of the Macedonian kingdom of Pergamos, and in B.C. 130 became part of the Roman provinces of Asia. The territory has never recovered from its devastations by the Saracens. Ionia was famous for arts, literature, and luxury.

Ionian Islands, a group of islands in the Ionian Sea, off the western coasts of Greece and Albania; formerly a republic under the protection of Great Britain, since 1864 part of the kingdom of Greece. The chief islands are Corfu, Santa Maura, Ithaca, Cephalonia, Zante, and Cerigo, and about eight others. The inhabitants are mostly of Greek origin. The productions include corn, vines, olives, currants, cotton, honey, and wax.

Iowa, one of the United States, bounded N. by Minnesota, E. by Mississippi, S. by Missouri, W. by Dakota and Nebraska. It was first colonised in 1832; the territorial government was instituted

338; it was admitted into the union 1846. Length, 35 miles; breadth, 190 miles; area, 56,025 square miles, three-fourths of which is luxuriant prairie. The capital is Des Moines; it was formerly Iowa, the capital of Johnson County.

Iowas (IOWAYS), a North American people, who were a branch of the Southern Dakotas, and whose domain formerly comprised several western affluents of the Middle Mississippi; especially the Iowa, named from them. None are now found on the banks of this river, or in the State of Iowa, also named from them; but a few still survive in the great Nemaha Reservation, Kansas, and in the Sac and Fox Reservation, Oklahoma—these two groups, with a few individuals elsewhere, jointly numbering about 300. The Iowas were the constant allies of the Algonquian Sacs and Foxes, whose hunting-grounds extended along the opposite (left) bank of the Mississippi.

Ipecacuanha, the root of *Cephaelis ipecacuanha*, a cinchonaceous creeping herb, native to Brazil, which is a most valuable emetic. The root is flexuous, little branched, and distinctly annulated; the leaves are oblong-obovate; and the small pentamerous flowers are collected in heads surrounded by a leafy involucre, and are dimorphic. The plant grows in moist shady forests between 8° and 22° south latitude. Though previously in use in Brazil, it was only introduced into Europe in 1672. As imported the root is a greyish or reddish brown, has a musty odour, and a bitter taste. It comes from Rio, Buenos Ayres, or elsewhere, in "serons," or cow-hide bales, weighing from 100 to 180 lbs., and our annual imports are about 65,000 lbs., valued at nearly £15,000. The plant has been introduced into India, through the Edinburgh Botanic Garden, since 1866, but not with much success. Other plants with emetic properties in a lesser degree are also known as ipecacuanha, but none of them are similarly annulated. The drug is largely used in medicine in the form of the acetic acid extract and of ipecacuanha wine; it is also made up in lozenges, and a lozenge containing morphia and ipecacuanha is sometimes prescribed. The well-known "Dover's powder" contains ipecacuanha, opium, and sulphate of potassium; this preparation is frequently employed with a view to promoting secretion from the skin. The pill of ipecacuanha and squills (which also contains opium) is often used in lung affections. Ipecacuanha is, however, best known for its emetic action, the wine being not infrequently used in cases where it is considered desirable to produce vomiting in children.

Iphigenia, or IPHIANASSA, daughter of Agamemnon and Clytemnestra, who was sacrificed to procure favourable winds for the Greek fleet assembled at Aulis for the expedition against Troy, where they were detained owing to Artemis' wrath against Agamemnon. In one version of the legend Artemis saved her to be her priestess at Tauris, whence she was rescued by her brother Orestes.

Ipswich, a seaport on the Orwell, 12 miles from Harwich, market town and capital of East Suffolk,

a municipal, parliamentary, and county borough. The chief industries are agricultural implements, with other engineering works and manufactures. Many remains of old timber in the houses show the antiquity of the town, which contains several interesting churches and handsome public buildings, including a museum, art gallery, mechanics' institute, public library, and the East Suffolk Hospital (founded 1835). Queen Elizabeth's school was endowed 1482; but its property was alienated with that of the priory of St. Peter and St. Paul, by Cardinal Wolsey, in 1528, to form the College of St. Mary. Soon the endowment was seized by King Henry VIII. (1535). Elizabeth in 1565 renewed and confirmed the charter. The principal exports are agricultural implements, railway plant, artificial manures, oils, oil-cake, bricks, and agricultural produce. Pop. (1901), 66,622.

Iquique, a seaport in Peru, in the province of Moquegua, 3½ miles west by south of Tarapaca. Its chief exports are nitrate and borax, and the imports barley, flour, liquors, coal, machinery, iron, and steel. It was destroyed by earthquakes in 1868 and 1877, and in 1879 blockaded, bombarded, and captured by Chili.

Irak-ajemi, a province in Persia containing the cities of Teheran and Kashan.

Irak-arabi, the ancient Babylonia and Chaldea, watered by the Tigris and Euphrates.

Iranians, the indigenous inhabitants of the tableland to which they give their name, and generally of the whole region extending from the headwaters of the Euphrates and Tigris east to the north-west frontier of India. Their domain also comprised most of the Hindu-Kush, the western and northern slopes of the Pamir, and other tracts in eastern Turkestan since occupied by peoples of Mongolic stock. Irania thus includes the present Armenia, Kurdistan, Persia, Afghanistan, Baluchistan, Badakhshan, with parts of Bokhara and Fergana, all of whose primitive inhabitants form collectively a distinct and well-marked branch of the Aryan race, and most of whom were for long ages comprised within the limits of the old Persian empire. *Iran*, still the official name of Persia, is a term of extreme antiquity, being a modified form of *Airyana*, which originally designated the land of all the Aryas—that is, of the settled agricultural populations of Aryan speech as opposed to Turan, land of the northern nomads of Turki speech. In recent times these nomads have encroached at many points, and especially in Persia, on the Iranian domain, which has also been invaded by other nomads, the Semite Arabs, from the south-west. Many of the Iranians themselves (Kurds, Baluchis, Afghans) have either reverted to the nomad state, or always been nomads, owing to the arid nature of the lands they were compelled to occupy. Thus from the remotest times the Iranians are found divided into various groups, some constituted in powerful civilised states with a knowledge of the arts and letters, others scattered, as they are to this day, in small and rude pastoral communities over

the surrounding steppes. Such were in the north the *Baktrians*, representing the oldest Iranian culture, and the first to be organised in a great political body; the *Arakhotes* and many other hill tribes in the east, ancestors or precursors of the present Afghans; the *Gedrosians* in the south, rudest of all, from whom most of the modern Baluches are descended; the *Persians* in the south-west, who became under Cyrus the dominant people of Irania; lastly, in the west and north-west the *Medes*, who are now perhaps represented by the Armenians, but whose affinities have not yet been clearly determined. The Baktrian culture was spontaneous, and purely Aryan, whereas that of the Medes and Persians was developed under Semitic (Assyrian) influences, so that the *Pehlvi* (*Huzvareh*) language current in the west under the Akhemenides, Arsacides, and Sassanides, became profoundly modified by Semitic elements. It was superseded by the *Farsi*—that is, the pure Iranian tongue of Fars, or Persia proper—from which is descended the neo-Persian, the literary language of most Iranians. But this also has become saturated, at least in its vocabulary, by a vast number of Semitic terms introduced by the Moslem Arab conquerors of the old Persian monarchy. At present the political autonomy of the Iranian peoples is confined to the new Persian monarchy, reduced to narrow limits, and ruled by a "Turkoman" (Turkoman) "king of kings." The Afghan Amir and the Khan of Baluchistan are virtually dependent on the British rāj, while the whole of Irania lies under the shadow of the northern Colossus. (Dr. F. Spiegel, *Erān, das Land Zwischen dem Indus und Tigris*, 1863.)

Iranic Languages form one of the main divisions of the Aryan linguistic family [ARYAN LANGUAGES], somewhat intermediate between the Indic and Hellenic, but considerably more akin to the former than to the latter branch. There are three distinct groups, the first comprising the *Old Baktrian*, commonly called *Zend*, in which are composed the *Avesta* and *Little Avesta* (Vendidād, Vispered, and Yasna), that is, the sacred writing of the Zoroastrian religion, and which is now best represented by the *Pushtu* (*Pukhtu*) of Afghanistan, and the *Galcha* tongues of the lagnob valley and Kafiristan; the second comprising the *Old Persian* of the trilingual cuneiform inscriptions (1st column), which later degenerated into the mixed Irano-Semitic *Pehlvi* (*Huzvareh*), and ultimately died out after the overthrow of the Sassanid dynasty by the Moslem Arabs in the 7th century. It is now best represented by the *modern Persian* literary language, which took its rise in Fars (Persia proper) about the year 1000 A.D., and to which the vernaculars of Kurdistan, Baluchistan, and Luristan (Bakhtiari Highlands) are cognate. The third group comprises the *Medic*, that is, the language of the middle column, which was probably the ancestor of the *Old* and *later Armenian*, and of the *Ossetian*, still current in the Darel district, Central Caucasus. Armenian preserves many of the old Aryan grammatical forms, which have mostly disappeared both in the modern Persian and Afghan, both now highly analytical and also mixed with numerous Arabic

terms and expressions. (Burnouf, Lassen, Rawlinson, Joseph Müller, Spiegel, Mohl.)

Irawadi, IRRAWADDY, or ERAWADI, a large river of Asia, which rises in South China, takes a southerly course through Thibet and Burmah, and discharges its waters by fourteen mouths into the Bay of Bengal; the most easterly channel passes by Rangoon. The large delta is chiefly jungle.

Ireland lies between lat. 51° 26' and 55° 23' N., and long. 5° 20' and 10° 26' W. It is bounded on north, west, and south by the Atlantic, and on the east by the Irish Sea or St. George's Channel. Its length, measured from Fair Head (Co. Antrim) to Crow Head (Co. Kerry), is 306 miles; its breadth from the extreme points of Mayo and Down, 225 miles. The total area is 32,524 square miles. The population according to the latest census, that of 1901 was 4,456,546, of whom 3,310,028 are Catholics.

Geography. Ireland is divided into four provinces, Ulster, Leinster, Munster, and Connaught, divisions, however, which now have hardly any practical significance, and are used mainly for geographical or topical reference. The origin of the names Ulster and Leinster is unknown, though various fanciful explanations have been offered. Connaught and Munster seem to derive theirs from famous kings who flourished in the second century—viz., Conn of the Hundred Battles, a northern, and Mumhan, a southern king. Connaught is in Gaelic *Conn-acht*, i.e. the children of Conn. Leth Mumhan, or Mumhan's Half, was originally the name of the whole of the south of Ireland. The suffix *ster* joined to the names of these by the four provinces is of Norse origin, and commemorates the age of Viking predominance in Ireland. The capital of Ireland is Dublin (Dub-linn = Black Pool), at the mouth of the Liffey. The counties of Ireland, thirty-two in number, are as follows:—*Ulster*—Antrim, Armagh, Cavan, Donegal, Down, Fermanagh, Londonderry, Monaghan, and Tyrone. *Leinster*—Carlow, Dublin, Kildare, Kilkenny, King's County, Longford, Louth, Meath, Queen's County, Westmeath, Wexford, and Wicklow. *Munster*—Clare, Cork, Kerry, Limerick, Tipperary, and Waterford. *Connaught*—Galway, Leitrim, Mayo, Roscommon, and Sligo. Before the Norman conquest there was a fifth province, Meath, which embraced the modern counties of Meath, Westmeath, Dublin, Louth, Longford, and portions of the adjoining counties—in fact, the whole mid-region of Ireland. From this territorial division a large tract around Dublin was withdrawn some time before the Norman conquest and formed into a Danish kingdom governed by Norse kings. Meath was erected into a palatinate by Henry II., and for centuries after the conquest was regarded as a special territorial division of the country; but in more modern times Meath has, as it were, lapsed into and been lost in Leinster.

Physical Aspect. Ireland, as to its eastern shore, is comparatively unbroken, and the shore-lands are low; but in the west, where it faces the Atlantic, the coast is broken and indented at a hundred points, and presents everywhere to the ocean a succession of high and rugged cliffs. The whole interior of the island is a champaign, rising here and there into



PHYSICAL MAP OF IRELAND.

mountain ranges ; but along the sea-coast it is girt with a rampart of mountainous country or zone of hills whose width averages about twenty miles. The mountains of Ireland are almost always soft and rounded in outline, and clothed with vegetation to the summits. Hence their character is oftener pleasing and picturesque than sublime and striking.



MAP OF IRELAND.

They are usually boggy, and on some the bogs run quite up to the summits. So Irish rivers never run very low even in the hottest summers, for the bogs hold the water like a sponge, and give it away slowly. The principal ranges are the Wicklow Mountains, the Galtees in Tipperary, the Slievenaman range between Tipperary and Waterford, the Mourne Mountains in Down, and the M'Gillicuddy's Reeks in Kerry. A very conspicuous mountain to those who cross the Channel is Slieve Donard, chief of the Mourne range, and the greatest mountain on the east side of Ireland. A remarkable geological feature is the great limestone plain which occupies almost the whole of the central district extending from Dublin to Galway and from the confines of Ulster to the borders of Cork and Waterford. This plain has a soil of great fertility. The most fertile portion of it, celebrated as the Golden Vale, runs from Limerick in a south-easterly direction through Tipperary. The soil of Ireland, which is excellent for grazing and root crops, does not lend itself remarkably to the production of cereals. Owing to the fine quality of the soil and the humidity of the climate the vegetation is rich, and its colour at certain seasons of the year brilliantly vivid. Hence

"the Emerald Isle," one of Ireland's many names. In ancient times the country was known as the "Isle of Woods," on account of the number and extent of its virgin forests, which at one time seem to have almost covered the island, so that various ancient kings, whose claims to remembrance seem to rest on their activity as wood-cutters, are honourably mentioned in the chronicles. These woods, much reduced in numbers and extent, were quite destroyed in the 17th century by Cromwellian settlers, who cut them down for smelting purposes and for export. In spite of the efforts of public-spirited landowners in more recent times to plant their estates, the island is by no means well-clothed in this respect. Those ancient forests supplied shelter to red-deer, wild oxen, and wolves. As late as the time of Cromwell the wolf was a public nuisance, so much so that the State supported packs of hounds for its suppression. In rivers and streams Ireland is particularly rich. The principal river is the Shannon, which flows between Leinster and Connaught, and which in its course forms such noble expansions as Lough Ree and Lough Derg, the Boyne, a beautiful stream flowing along the southern border of Ulster, the Liffey, the Moy, the Lee, the two Blackwaters, and the Suir, the Nore, and the Barrow, which unite their currents before meeting the sea at Waterford. All the Irish rivers have been celebrated by Edmund Spenser in the *Faërie Queene*, and described by him at length and with considerable local knowledge. The lakes of Ireland, besides those already mentioned, are Lough Neagh in Ulster, a splendid sheet of water, Lough Erne, the picturesque lakes of Westmeath and of Killarney, and Lough Mask, Lough Con, and Lough Corrib in Connaught. In former times the lakes of Ireland were far more numerous and of greater extent. Crannogs, or the remains of lacustrine habitations, are now often turned up in quite dry ground.

Inhabitants. The people of Ireland are composed of various racial elements. In prehistoric times the country was inhabited by a race supposed to be akin to the modern Basques, small, dark-haired, with oval-shaped heads. These people, at some date beyond the reach of history, were conquered by the Celts, large, fair-haired, blue-eyed, round-headed ; according to tradition, the Celts reached Ireland from Spain. In the commingling of these races the language of the aborigines was lost. In the result we have a people generally but improperly regarded as the Celtic-Irish. The population became still more composite during the 9th, 10th, and 11th centuries, by the introduction of a very considerable Norse element. Again, in the 12th and 13th centuries, as the result of the Norman conquest, great numbers of Normans, English, and Flemings settled in the country. The frequency of such names in Ireland as Fitzgerald, Burke, Butler, Lacy, etc., shows the extent to which the Norman element has entered into the population of the country. The last important addition to the racial stocks was supplied by the English and Scotch colonists who settled in Ireland in the 17th century. To superficial observation the modern Irish nation consists of this English and Scotch element, on the one hand,

and a numerically greater Celtic element on the other, the former Protestant, and the latter Catholic. But, in fact, this so-called Celtic element is itself, as has been shown, highly composite; nevertheless, certain pronounced Celtic traits, showing the strength of the original stock, pervade the whole population. Generally speaking, we may say that the Irish are quick of thought and fluent of speech, and attach more importance to the assertion of individuality than to the authority of settled laws and rules. Their instincts are warlike. They are readily converted into soldiers, and, under a system which is at the same time just, firm, and considerate, adapt themselves more easily to discipline than might be expected. The Royal Irish Constabulary, numbering about 15,000 men, are singularly well-disciplined and well-conducted. The Irish character not being stiff and hard, but plastic rather, is readily affected by influences whether for good or bad. The mass of the population is Catholic in the ratio of nearly four to one, and up to the present time has been more under the influence of priests than any other European people. Recent events, however, seem to prove that the secular spirit is stronger than has been suspected, and that in future sacerdotal authority will be greatly reduced. The agrarian legislation of modern times, which has substituted for the peasantry fixed instead of capricious rents, and rendered them independent of their landlords, will probably produce a more self-reliant and self-respecting type of character than that which has hitherto been associated with the Irish peasant. Within the last quarter of a century the standard of comfort has risen greatly. Those who cannot secure adequate means of livelihood at home emigrate. They refuse to accept the poor and meagre conditions which satisfied their fathers. The peasantry must in future constitute the dominant political power of the island. Though Belfast and some other northern towns flourish through their linen manufactures, the industries of the country are mainly agricultural and pastoral. The future of Ireland, therefore, depends upon the peasantry. From the character of recent agrarian legislation it is probable that this class will ere long become proprietors of the soil, and probably exhibit a radical alteration of character.

History. It is now known that the history of Ireland, like that of the Norsemen, the Greeks, and other nations, commences with, or rather is prefaced by, an account of the ethnic deities worshipped by the people. The "idle fables," the strange and grotesque accounts of dim prehistoric races, Ceasairians, Nemedians, Tuatha De Danan, etc., are found to have a great significance. The religion of the Pagan Irish, so far as it can be recovered, is to be sought in those idle fables. Irish history is hardly studied at all in Ireland, but this branch of it is being studied very profoundly on the Continent. The impetus in this direction has been given by the study of Celtic traces in France and elsewhere on the Continent, and by the paucity of the results obtained in spite of all searching. Continental savants, having learned that Ireland possesses a very ancient Celtic literature, have betaken themselves

to its study with great avidity. The earliest authentic history does not show the Irish people in a tribal condition. They seem to have emerged from that state at a time prior to the advent of St. Patrick, whose evangelising mission to Ireland commenced in 432. He had previously spent his boyhood in the country, having been captured and enslaved by a band of Irish pirates. In this and the preceding centuries the Irish, under the name of the Scoti, had been overrunning Britain and carrying their predatory incursions into the heart of Gaul. The most famous commander of the Scoti at this period was Nial, surnamed "of the Nine Hostages." According to one account, it was Nial himself who actually took captive the boy Patrick. The apparent ease with which St. Patrick evangelised Ireland proves that for a long time prior to his arrival Christian influences from Britain and the Continent had been stealing into the country. St. Patrick was a man of a great and commanding personality, well equipped by nature to cope with Druids and hostile Pagans in all such assemblies as he frequented. Some of his writings survive. The finest of them by far is a hymn called the *Lorica Patricii*, or the Breastplate of Patrick, a very noble and even sublime effort in religious poetry. It has been incorporated in the hymnology of the modern Protestant Church of Ireland, and is sung annually in St. Patrick's Cathedral in Dublin. After the death of St. Patrick the Irish Church assumed an exclusively monastic form. The monasteries which were now founded in a short time became renowned over all northern Europe for sanctity and learning. Chief among these were the monasteries of Bangor, Clonard, Clonmacnoise, Durrow, and Iona. The latter, though erected on an island off the Scotch coast, was the work of an Irish saint, the celebrated Columba, who, in ecclesiastical fame, ranks next to St. Patrick. Ciaran, founder of Clonmacnoise, is the third most famous. Such was the repute of these Irish monasteries that in the 6th and the succeeding centuries great numbers of Saxon youths and votaries of learning from different parts of the Continent passed into Ireland and resided in the monasteries. The Venerable Bede, mentioning the fact, relates that the monks charged their foreign pupils nothing for instruction, and even supplied them freely with food and books. The learning taught in these monasteries was derived partly from the Scriptures and partly from the literature of Greece and Rome. So, apart from religious and moral instruction, culture in these monasteries assumed quite a scholastic aspect. In spite of the fame, no doubt a well-deserved fame, of the Irish monasteries of this period, they produced no original literature if we except their biographies of the saints, which are curious rather than excellent. It is generally stated that the progress of the monasteries was checked by the ferocious plundering expeditions of the Norsemen in the 9th and succeeding centuries, but the better opinion is that the religious and scholastic mission of these institutions was exhausted before the advent of the Norsemen. The *Lives of the Saints*, produced at this time in great numbers, indicate low and contracted views. For example, it was generally taught

that at the Day of Judgment the men of Ireland would be judged by the Irish saints and, according to their decisions, consigned to everlasting weal or woe. This, of course, shows that monastic Christianity had undergone a radical perversion. The first Norse invaders directed their ferocity mainly against the monasteries. They seem to have been animated by religious zeal for the extension of the worship of Odin and Thor. Armagh and Clonmacnoise, the chief centres of Irish Christianity, they converted into the chief centres of the Norse religion, and in both places set up the worship of the northern gods. The Vikings, who at first assailed the country in a desultory fashion, later on submitted to the control of a powerful sea-king, whom the Irish historians call Turgesius, a Latinised form of Thor-gils (Servant of Thor). Turgesius was almost certainly the famous Ragnar Lodbrog. Turgesius having now the exclusive control of the sea, presently made himself also Ard-Righ or High King over all Ireland. Norse power, however, gradually declined, so that eventually the Norsemen, having established walled cities at the mouths of all the great rivers, were satisfied with the monopoly of the carrying trade of Ireland. Eventually the Northmen of Dublin, in union with their kinsmen of Northumbria and the Hebrides, made a desperate attempt to re-establish Norse dominion in Ireland. They were defeated at Clontarf by Brian Boru, the Irish king. This was the greatest battle fought anywhere in the Viking period, and the fame of it went over all northern lands. For two and a half centuries now the Irish were left to themselves. There were ceaseless wars between the great dynastic families of the island, but before the advent of the Normans none of these families succeeded in establishing a clear right to the sovereignty. Under these circumstances Dermot M'Murrough, King of Leinster, was expelled from Ireland by a coalition of all the other kings under the command of Roderick O'Connor, King of Connaught, who then possessed the dignity of Ard-Righ. The exile, fleeing to Wales, came back leading with him a gallant body of Norman gentlemen, chief of whom was Richard de Clare, surnamed Strongbow. Strongbow's Normans and Dermot's Leinstermen made such rapid progress that the conquest of all Ireland by them seemed almost a mere question of time. Owing to the hostility with which the Irish *reguli* regarded each other, it began to seem probable that they would end by accepting the dominion of Strongbow as supplying a new and better basis of sovereignty. Henry II. took the alarm. He collected an enormous fleet and army, came to Ireland, and was accepted by the *reguli* as "lord" of all Ireland. Henry II. divided the island into great Palatinates under a new race of Norman nobles such as Hugo de Lacy, John de Courcy, William de Burgo, and others. These new lords had the *reguli* under their control, many of whom were quite loyal to their Norman superiors, and gave them faithful service. Henry II., however, feared to give any of these lords any considerable power over the rest. So did the Plantagenet kings who succeeded him. The consequence was that wars arose between these great Norman Palatinate

lords, under stress of which the Norman system, which at one time seemed promising, crumbled away, and the old Irish families of noble or kingly origin revived and became powerful. A great destruction, too, fell upon the Norman noblesse during the ruinous invasion of Ireland by Edward and Robert Bruce in the 14th century.

So at the commencement of the Tudor dynasty Ireland was quite ungoverned. The country was divided between some sixty great lords, Norman nobles and Irish chieftains. The 16th century was the grand turning-point in Irish history. The Crown now came into collision with these lords. The lords, though generally incapable of combination, were an able and warlike race of men, and fought strenuously to maintain their independence against the encroachments of the State. The smaller lords, however, and the gentry of the country were, on the whole, hostile to the great lords and friendly to the Crown; also all the walled cities, inland and seaboard, were enthusiastically devoted to the State. Of the rebellions of the dynasts, the greatest by far was that of which Hugh O'Neill, Earl of Tyrone, was leader. He succeeded in combining all Ulster against Queen Elizabeth, and, but for the intense hostility of the rest of Ireland, would certainly have triumphed. Throughout all these sixteenth century convulsions Ireland as a whole co-operated with the Crown. In fact, everywhere over Europe about this time, whenever the Crown came into collision with the great feudal lords, we find the people in general siding with the former. Eventually all the great Irish lords were subdued or exterminated, after which for the first time in her history Ireland enjoyed the blessing of universal peace. It was during this period that James I. carried out the plantation of Ulster. Peace was interrupted in the reign of Charles I. by a rebellion, the leaders of which pretended that they rose for the purpose of supporting that king's authority, which was at that time menaced by the Parliament of England. This rebellion was attended by a massacre of the Protestant planters of the north. Bad as was this business, it hardly surprises one who is familiar with the convulsions of the 16th century, when the massacre of non-combatants was so common as to be regarded as almost a necessary incident of war, like the destruction of growing crops and the slaughter of cattle. A period of great civil strife and confusion now succeeded. Three or four distinct parties appeared, all in arms, and much blood was shed. Eventually the Marquis of Ormonde combined all Ireland against the English Parliament in support of the rights of Prince Charles, afterwards Charles II. Parliament sent Cromwell to Ireland, who in a few months broke the Royalist confederacy to pieces. Huge confiscations now followed, and the remnant of the Royalist gentry were driven over the Shannon and confined to the province of Connaught. A second period of peace succeeded under a Puritan régime. Industry and trade flourished, and Ireland, as to her national interests, made rapid progress. When later on the English people revolted against and drove out James II., the Irish people combined to support him. Their hopes of maintaining the lost

cause of the Stuarts were frustrated by the battle of the Boyne, where the Irish Jacobites were defeated by William III. King James, who was present, fled out of the battle and made off for France in a rather scandalous fashion. The Irish, though deserted by their king, fought on with great gallantry, but could not make head against the vastly superior forces which William was able to direct against them. The Catholic noblesse now quite lost their estates, and almost to a man passed over to the Continent as professional soldiers, taking service chiefly under the King of France. Many of these exiles distinguished themselves greatly on the Continent. A Protestant aristocracy succeeded them in Ireland, and governed a Catholic population which was quite docile and submissive. The latter had no political rights and few civil, and were still further depressed by the enactment of penal laws of a very harsh and tyrannical character. While the Protestant aristocracy governed the people, they were themselves governed from London. They were satisfied with this arrangement, but as time went on became more ambitious. In 1782, finding themselves a power, and even a military power, they declared the legislative independence of their Parliament. The subject Catholic population now began to agitate for political rights. Their claims being resisted by the aristocracy led to the bloody rebellion of 1798. This rebellion precipitated the Act of Union, which was passed in 1800. The Catholics hoped to get better treatment from the Imperial Parliament, and the aristocracy began to fear that, though they had triumphed in 1798, they might be overborne and destroyed in the next revolutionary movement by the people. The subsequent history of Ireland merges in that of Great Britain. The most notable events have been the Catholic Emancipation Act of 1829, due to the courage and persistency of the great agitator, Daniel O'Connell, the rise and the progress of the Home Rule movement, and the remarkable agrarian legislation to which attention has been already directed.

The constitutional history of Ireland resembles in its main features that of England. Before the Conquest the chronicles frequently refer to great conventions of the laity and clergy for the enactment of laws. These assemblies were not representative, but similar to those general assemblies of freemen common to all the northern nations of Europe. They were summoned, however, and presided over by the Ard-Righ. After the Conquest the kings of England frequently convened assemblies of a parliamentary character resembling those which they convened in England. The Christmas banquet to which Henry II. invited all his Norman and Celtic feudatories—an event referred to in all the histories—was probably an assembly of that nature. Records of writs summoning the feudatories have been preserved dating as early as the reign of King John. These writs are addressed not only to the usual classes of persons then summoned to great councils, but to knights, citizens, merchants, burgesses, and freeholders. Later on it is evident that only those of English origin were summoned to such assemblies. In the

reign of Edward I. the principle of elective representation of the Commons was introduced, the sheriffs (1295) being directed to cause two good and discreet knights from each county to be chosen at a full assembly of the freeholders. This assembly may be regarded as, rightly speaking, the first Irish Parliament. In 1311 the election principle was extended to boroughs. From this time forward, however, the authority of the kings of England was greatly reduced, so that the succeeding Parliaments represented only a small portion of the provinces of Meath and Leinster called the Pale. In the 16th century, with the revival of royal authority, Parliaments assumed a corresponding dignity. In 1541 a Parliament was held in Dublin which included not only the Norman nobles, but all the principal Irish chieftains. The object with which that assembly met was to confer the title of King of Ireland upon Henry VIII., the kings of England from the time of Henry II. having been only lords of Ireland. Another important Irish Parliament of this century was that which is commonly called Perrott's Parliament. It was held in 1585, and was also representative of the whole of Ireland. For twenty-seven years after this there was no Parliament, but in 1613 James I. summoned another also representative of all the nation. Lest the native Irish should control the assembly, King James had enormously increased the representation of boroughs, taking care that the new parliamentary boroughs should be those occupied by English and Protestant settlers. Generally speaking, the parliamentary arrangements now made by King James lasted down to the Union. Though most of King James's boroughs never became more than hamlets, the Irish Parliament continued to be dominated by the borough interest. Of course these boroughs were bought and sold, and continued to fetch prices that increased from year to year. Under the Plantagenet and Tudor dynasties, Irish Parliaments, though sometimes a little restive, on the whole recognised in the Imperial Parliament a right to make laws binding in Ireland, while denying the right of the Imperial Parliament to tax the smaller country. In the reign of Charles I., the Imperial Parliament having expressly asserted a claim to make laws binding Irishmen, the Irish House of Commons passed an unanimous resolution that "his Majesty's subjects in Ireland are a free people, and to be governed only according to the common law of England and the statutes made and established by Parliament in Ireland." As both Parliaments were presently overthrown by Oliver Cromwell, this constitutional collision led to no further developments. Cromwell, it may be observed, summoned thirty persons from Ireland to his first Parliament. Something of the same nature had been done once before—viz., by Edward III., when he desired to get a subsidy from Ireland. On that former occasion the Irish obeyed but protested against the innovation. The international dispute so heralded produced no fresh developments till about the year 1750. The Irish Parliaments were conscious of weakness and dependency, and all friction was avoided by the operation of Poyning's Law. This law, made at the close of the 15th,

century, deprived Irish Parliaments of the right to make laws without the previous consent of the Imperial Government. From 1750 to 1800, the date of the Union, the two Parliaments were in perpetual collision. The Union, of course, ended that controversy, which, however, in a different form, has been revived in our time, and given birth to the Home Rule movement.

Literature. The literary history of Ireland is interesting and peculiar. Published or unpublished, there still remains a vast amount of indigenous Gaelic literature seemingly of Pagan origin, and little, if at all, affected by Christian influences. It consists of ancient poems and of tales which have been evidently built up from pre-existing metrical cycles, the original verse showing through the more modern prose at many points. It represents the work either of the Christian bards or of a literary class of Christians perhaps, but dominated by influences descending out of the Pagan times. This literature is concerned mainly with the achievements of famous kings and warriors, is of enormous extent, and of great but rude excellence. It celebrates the simple cardinal virtues, and in many respects anticipates the chivalrous literature of later times. The most ancient collections of this curious literature were made before the Norman Conquest, and are contained in two celebrated manuscripts called the *Leabar-na-Huidre* and the *Book of Leinster*, which were written respectively in the 11th and 12th centuries, and are still extant. These books are, in fact, great collections of folk-lore. Many other collections have been made since, and it is worthy of notice that many tales written down quite recently from the lips of Gaelic-speaking peasantry in Ireland and in the Hebrides are almost as antique in their character as those pre-Norman compilations. The literary creative impulse was seriously checked by the introduction of Christianity, and the intellectual predominance of the monasteries, in the 5th and succeeding centuries. The bardic classes, however, continued to do their proper work side by side with the representatives of monastic learning. The Irish monasteries, whose intellectual life was dominated by the literature of Greece and Rome and by religious influences, produced no original work. The genius of scholasticism is not creative; the work of the Irish monasteries during the centuries of their fame lay rather in the direction of study than of production. They produced numbers of learned men, but, in Ireland at least, no great writer. On the other hand, many Irishmen trained in the monasteries became famous as writers after they had left Ireland and participated in the intellectual life of the Continent. The most famous of these men were Columbanus, Scotus Erigena, Duns Scotus, and Vergil "the Geometer." Irish monastic and bardic culture both received a fatal blow in the Norman Conquest, which, indeed, was not so much a conquest as a social and political revolution. The country generally at this time shook off all old associations, and adopted new ones more in harmony with the prevalent spirit of Europe at that time. Under the Norman régime there was no literary production. Monastic life was purely religious or

academic, and, though the bardic classes survived and to some extent even flourished, they confined themselves rather to the study, transcription, and preservation of the ancient heroic and romantic literature composed by their predecessors. The Tudor conquest of Ireland in the 16th century, which was also, and in a still more marked degree, a revolution rather than a conquest, was the death-blow of the bardic fraternity. The complete overthrow, extermination, or degradation of all the old dynastic families of the island, and the universal assertion of the authority of the Crown and the dominance of English law, rendered the cultivation of Gaelic literature a thing of the past. The Tudor conquest decided that Ireland should be an English-speaking country. In the reign of James I. the expiring Celtic civilisation uttered what might be called its "swan-song" in the noble literary work called *The Annals of the Four Masters*. It is a history of Ireland written by representatives both of the monastic and bardic classes, and breathes throughout a blended spirit of piety and heroism. If all other Gaelic literature were destroyed, *The Annals of the Four Masters* would exhibit in a very remarkable manner all the leading traits and features of Irish Celtic civilisation. Henceforward the literary spirit of Ireland began to express itself in the English tongue. During the 17th century the conflict of the two languages prevented anything notable being effected in either. In the 18th century, the victory of the English language and the English form of civilisation being complete, Ireland began again to produce literary men and original literature. The first representative of Anglo-Irish literature was Laurence Sterne. Sterne's *Tristram Shandy* marks the commencement of a quite new order of literature. From *The Annals of the Four Masters* to *Tristram Shandy* there is a gulf of separation as great as that which divided the Protestant English-speaking and law-abiding Irish gentlemen of the 18th century from the rude but brave, warlike, magnanimous, and religious feudal Irish dynasty of the 15th and 16th centuries. The student who passes from one of those books to the other will feel at once the great revolution of thought and sentiment which had taken place in the interim. Besides Sterne, Ireland in the 19th century produced two great writers, Burke and Goldsmith. It opened with the name of Thomas Moore, whose Irish melodies, though often assailed by critics, certainly possess an endearing charm. After Moore a brilliant school of novelists appeared on the scene, the chief of whom were Carleton, the describer of Irish peasant life, and Lever, the gay delineator of the manners of the Anglo-Irish gentry. Even the minor writers of this school wrote with much eloquence and spirit. During the rebellious movement of '48 a number of brilliant literary men appeared: Darcy McGee, John Mitchel, Gavan Duffy, Thomas Davis, and others, some of whose work, especially their songs, seem likely to live. In our time Anglo-Irish literature shows a tendency which may culminate in a school of Irish historical romance or a literary presentation of Irish history.

Ethnology. According to the national traditions, confirmed by archæological research, Ireland was

ready occupied by an aboriginal population before the arrival of the Celts, who have formed the bulk of the inhabitants from remote prehistoric times. These Celts belong to the Gadhælic, or older branch [CELTS], and are fabled to have come from Spain under a mythical leader, Milesius, hence known as "Milesians"), at some unknown epoch. Both elements, represented by the two types of skulls found in cairns and barrows, still survive, the pre-Celtic chiefly in the West (Kerry, Cork, Connaught, Donegal), the Celtic in the central and south-western districts. The former is distinguished by long heads flattened at the temples, small and slightly snub nose, very long upper lip, large cheek-bones, black hair, swarthy complexion; the latter by round heads, grey or blue eyes, and fair hair. Elsewhere the populations have long been of a mixed character, the prevailing elements being Dano-Celtic in the sea-ports Limerick, Cork, Waterford, Dublin; Anglo-Celtic throughout Leinster and East Munster, often indicated by the combination of blue eyes and black hair; Scoto-Celtic in the north-east of Ulster since the beginning of the 17th century. Although most of the island was converted to Christianity in the 5th century, and became a chief seat of ecclesiastic learning and monasticism during the four following centuries, prehistoric usages long survived in some of the more remote western districts, and the Inish-kea islanders, off the Mayo coast, were still almost pagans till about the year 1870. In some parts of Connaught and Donegal the people, representing the primitive pre-Celtic element, have retained an almost savage aspect, characterised by small eyes, flat features, low brow, bristly hair, and a quasi-Mongolic cast of countenance. But generally speaking the Irish, when not debased by hardships and a poor diet, are a fine race, handsomer and of more graceful carriage than the English or Scotch, while the women are unsurpassed for dignity and self-respect. Even in some of the western districts, such as Joyce's Country, Connemara, the men are remarkable for their gigantic size and herculean frames; and those of Tipperary, though somewhat smaller, are equally muscular and powerful, with nimble, graceful action. The mental qualities are distinctly Celtic, marked by great quickness, ready wit, brilliant fancy, an innate sense of art, and a well-developed musical faculty, combined with a lack of perseverance, a sanguine, impulsive temperament, fickleness of purpose, and generally a decided preponderance of heart over head. The Irish language, which possesses a literature rich especially in historic and legendary matter (records, annals, myths, folk-lore), has steadily declined since the 16th century, when debates were still carried on in Irish in both chambers down to the death of Henry VIII. (1547). O'Culanne, author of a superb elogy on the ruins of Timoleague, County Cork, was the last spontaneous Irish poet, and the *History of Ireland*, by Dr. Keating (ob. 1644), was the last serious Irish prose work. The language has ceased to be cultivated since about 1700, although Archbishop M'Hale of Tuam translated Homer and Moore's Irish melodies about the middle of the 19th century. It received its

death-blow from the famine of 1846-47, and in 1901 20,953 persons could speak Irish only, and 620,189 could speak Irish and English.

Ireland, SAMUEL WILLIAM HENRY (1777-1835) was articled to a conveyancer, and began at an early age to forge and cleverly utter remains of Shakespeare, as his father had a craze for discovering some scrap of the great dramatist's handwriting. Amongst his spurious documents were contracts between Shakespeare, Lowine, and Condell, a deed of gift to William Henry Ireland, a deed of trust to John Hemynge, a Protestant confession of faith by Shakespeare, letters to Anne Hathaway, and others, a new version of *King Lear*, and an original drama, *Vortigern and Rowena*, which Garrick produced at Drury Lane. He was exposed by Malone, and his drama broke down on its first performance. The rest of his life was passed in comparative obscurity and poverty. He published a full confession of his forgeries (1805).

Irenæus, ST., pupil of Polycarp and Papias, was presbyter, and, later on, Bishop of Lyons, at the end of the 2nd century. His opposition to heretics was very violent. Of his works, the first book of the *Libri V. adversus Hæreses* only remains in the original Greek; the rest are translations. He suffered martyrdom (after 202) in the persecution under Septimius Severus, and was canonised, his day being April 6th.

Ireton, HENRY (1610-1651), a celebrated Parliamentary statesman and commander in the Civil Wars of Charles I., was of good family, and was educated for the law; but on the commencement of the wars he joined the Parliamentary Army, and soon, by the influence of Cromwell, whose daughter Bridget he married, rose to be commissary-general. He commanded the left wing at Naseby, and was wounded and taken prisoner. On recovering his liberty he was largely responsible for the measures which placed the Parliament under the power of the army, and had a principal share in making the ordinance for the king's trial, at which he was himself one of the judges. He accompanied Cromwell to Ireland (1649), and being left by him as Lord Deputy, reduced the Irish to submission with much rigour. He died at Limerick. He was distinguished for vigilance, capacity, and a stern zeal for justice which even amounted to cruelty. After the Restoration his body was exhumed and suspended on a gallows.

Iridescence, the colour effects produced when reflected light is viewed from finely-grooved surfaces. The slight irregularities cause a difference in phase of the light reaching the eye, and interference (q.v.) results. Part of the light is quenched, and remaining colours alone produce their effects, which evidently vary when viewed from different points. Mother-of-pearl and shot silk exhibit the phenomenon very well.

Iridium (Ir.), a rare metallic element which occurs in small quantities in ores of platinum (q.v.), which metal it very closely resembles. It is a white lustrous metal, brittle, and very heavy, possessing the specific gravity of 22.4. It forms

numerous salts, the *iridous* and *iridio* salts, corresponding respectively to the oxides Ir_2O_3 and IrO_2 . Its atomic weight, according to the best determinations, is nearly 193. Owing to its rarity, it is not extensively used; but, alloyed with platinum, it forms a most durable, hard, elastic metal, which was employed for production of standard measures of length, and is used (or a similar alloy with *osmium*) for parts of physical apparatus where great hardness and almost absolute permanence is necessary.

Iris. In classical mythology, a personification of the rainbow. In the *Iliad* she is the messenger of Zeus, Hera, and other Olympian deities. She is regarded as the daughter of Thaumas (son of Gæa) and the Oceanid Electra, and sister of the Harpies. In art she is represented with wings on her shoulders and with a herald's staff; sometimes also with a pitcher.

Iris. A genus of Monocotyledons, giving its name to the order Iridaceæ. They are perennials having generally fleshy rhizomes, equitant sword-shaped leaves, and showy flowers presenting a wide range of colours and markings, which render them great favourites in gardens. They have a three-chambered inferior ovary with central placentation and numerous ovules; a perianth of six segments united below, the three outer reflexed and often furnished with a median beard-like outgrowth, the three inner erect, and often smaller; three epiphyllous extrorse stamens, their anthers over the beards; and the three carpels superposed (q.v.) upon them.



IRIS.

The columnar style divides into three spreading petaloid segments, each terminating in two triangular points, below which, and just above the anther, is the crescentic stigma. The species of the genus are natives of the north temperate zone, two being British. The rhizome of *I. florentina* has the odour of violets, and is used under the name of *Orris-root* in perfumery. It is imported from Leghorn, Trieste, and Mogador. The Florentine lily and the French fleur de lis are both taken from the iris.

Iris. [EYE.]

Irish Sea, the sea bounded on the E. by N.W. England and Wales, on the N. by Galway and the North Channel, on the W. by Ireland, and on the S. by St. George's Channel.

Iritis. The relations of the iris to the pupil of the eye render the condition known as iritis or

inflammation of the iris of very grave significance as affecting sight. In cases where effused lymph is allowed to contract adhesions with the underlying capsule of the lens, distortion of the aperture of the pupil results, and there is a continual tendency to a recurrence of succeeding attacks of iritis after the initial inflammation has passed away. Iritis is particularly apt to appear in association with syphilis; a rheumatic form of iritis is also described. The disease may be the result of injury, and may occur in connection with disease of adjoining structures in the eyeball. In the treatment of iritis atropine is largely used; by dilating the pupil it removes its inner margin from the neighbourhood of the capsule of the lens, and so prevents the formation of adhesions. The internal administration of drugs is determined by the constitutional condition upon which the iritis depends.

Irkutsk, capital of the Russian government of the same name, lat. N. $52^{\circ} 16' 4''$, long. E. $104^{\circ} 11' 41''$, situated on the river Angora, a flourishing town, carrying on a considerable commerce with China, Kamtschatka, Siberia, and Russia. The government of Irkutsk constitutes the Russian frontier towards China. The climate being cold and the winters long, travelling is difficult, except in the height of summer. The inhabitants are chiefly Russians, Tartars, and Mongols.

Irnerius, HIRNERIUS, WERNERIUS, WARNERIUS, GUARNERIUS (died before 1140), a distinguished jurist of Bologna, taught in the early years of the 12th century. He founded the school of *glossators* by his diligent studies of the Institutes and code of Justinian.

Iron (Fe.—At. Wt.=56) is at present the most important of all the metals which are known to man, and is that which finds the greatest application for manufacturing and general purposes. It has been known since early times, and was manufactured several centuries before the present era, many references to it occurring in the Bible and in many of the ancient classical writings. Free iron of terrestrial origin occurs only to a very small extent, being present in some volcanic rocks. In *meteorites*, however, large quantities of iron occur, both almost pure and associated with considerable quantities of *nickel* and other elements. In a state of combination, however, iron occurs very extensively, being one of the most abundant elements in the earth's crust. The chief natural compounds and ores of iron are the various *oxides*, as *magnetite* or magnetic oxide, Fe_3O_4 ; *hæmatite* and *specular iron ore*, Fe_2O_3 ; *brown hæmatite*, *limonite*, and other compounds of hæmatite with varying quantities of water; the *carbonate*, which forms chief constituent of a number of ores, as *blackband*, *clay ironstone*, *spathic iron ore*, etc. Besides these, which serve for the extraction of the metal, others occur as *pyrites*, FeS_2 , arsenical pyrites and numerous silicates of iron which occur in many minerals and rocks, especially in that class known as *basic rocks*. From these ores, after *calcination* (q.v.), i.e. heating to expel moisture, etc., the iron is obtained by a process of reduction or deoxidation by means of carbon, coal being usually employed, while *lime* is

also added to act as a flux. The carbon and the oxide of carbon, CO, produced by its incomplete combustion, unite with the oxygen of the ore, forming carbon dioxide, which escapes from the mouth of the huge *blast-furnace* (q.v.) in which the operation is performed. The lime combines with the earthy matter to form a fusible slag, which floats on the molten iron at the bottom of the furnace and is drawn off from time to time. The exact nature of the chemical changes is, however, even yet not completely understood. The iron so obtained is by no means pure. It is known as *pig iron* or *cast iron*, and contains as impurities small quantities of phosphorus, manganese, silicon, etc., and about 3 to 5 per cent. of carbon, which is present partly combined and partly disseminated through the mass, the differences in this respect causing the varieties of cast iron known as the *white* and the *grey*. It possesses a sp. gr. of 7.1 to 7.5, melts at about 1500° C., and has the peculiar property of expanding slightly on solidification, a property which is very useful in *casting*, the purpose to which this form of iron is chiefly applied. It cannot be employed for forging owing to its brittleness, neither can it be welded. From cast iron, *steel* may be obtained by the removal of the phosphorus, sulphur, etc., and part of the carbon present. The process by which this is done is known as the *Bessemer process* (q.v.), or the modification due to Thomas and Gilchrist [BASIC STEEL]. Formerly steel was obtained from *wrought iron* by the *cementation* process (q.v.), which has, however, become practically obsolete since the introduction of the former processes. *Steel* consists of purer iron than cast iron, as many of the impurities have been completely eliminated and the percentage of carbon is reduced to 1 or 1.5. It has a specific gravity of 7.6 to 8, and melts at a higher temperature than cast iron, 1800° C. If melted and cooled rapidly steel becomes very hard and brittle, but if slowly cooled it becomes softer, more ductile, and tenacious, and may be worked and forged. It is the only form of iron used for the manufacture of cutlery, etc.

Wrought iron is obtained also from cast iron, the process of eliminating the carbon being accomplished by melting the iron and exposing the molten mass to blasts of hot air, and afterwards again melting the iron so obtained with addition of small quantities of oxide of iron, and thoroughly stirring the mass—*puddling*—until it becomes of a pasty consistency. Wrought iron is in some places also produced directly from the ore, but not to a large extent. Wrought iron contains only about .2 to .5 per cent. of carbon, it has a sp. gr. of 7.6, is very tough, ductile, and malleable, so that it can be readily worked and forged. It has a higher melting-point than steel or cast iron, but possesses the property of entering into a pasty condition before it melts, so that it can be welded at a white heat.

Pure iron is almost unknown, being very difficult to obtain. The purest form is obtained by reducing the oxide in a stream of hydrogen, and it then forms a greyish powder which ignites with a sp. gr. of 7.8 if shaken into air. In contact with moist air

all varieties of iron rust, a coating of the oxide and hydroxide being formed. To prevent this it may be coated with zinc—*galvanised iron* (q.v.)—or with tin—*tinplate*. It possesses the power of being attracted by magnets, becoming itself simultaneously endowed with magnetic properties. Iron, however, soon loses this magnetisation, but steel retains it more permanently. Steel is hence used for magnets, while iron is used for manufacture of the electro-magnets in dynamos, etc. In acids iron dissolves, yielding *salts* of iron, of which two series exist, the *ferrous* (q.v.) and *ferric* salt (q.v.). It forms a number of oxides known as *ferrous oxide*, FeO, *ferric oxide*, Fe₂O₃, *magnetic oxide*, Fe₃O₄, while some compounds appear to contain an oxide of composition FeO₃ which does not exist free. Besides the innumerable uses to which iron in its different forms is applied, the salts and compounds are also largely employed for technical and medicinal purposes. Thus the sulphide—*pyrites*—is largely used as a source of sulphur and sulphuric acid, while in dyeing, iron salts are extensively used as mordants, as also in the manufacture of ink and in tanning, *copperas* (q.v.) being the salt chiefly employed. The citrate of iron and ammonia, as also the citrate of iron and quinine, are very largely used in medicinal preparations, while the precipitated hydrate is also used as an antidote in cases of arsenical poisoning.

Iron Age, a term used to denote the period, or the civilisation of the period, when iron replaced bronze as the general material for tools and weapons. In all cases, however, the Ages of Stone, Bronze, and Iron did not all occur. In Africa the transition seems to have been directly from stone to iron implements, and it is within quite recent times that the use of the latter has spread to the Hottentots, whose legends enshrine the memory of the time when their ancestors used stone tools for cutting down trees. On the other hand, Mexico and Peru were in the Bronze Age, when the Spaniards invaded South America in the 16th century. The Iron Age cannot, of course, be referred to any definite period. The *Odyssey* speaks of the use of iron, though weapons and armour were generally of bronze. Iron is mentioned with copper in Babylonian and Egyptian inscriptions, and the British Museum possesses a piece of wrought iron from the masonry of the Great Pyramid. Among the Jews, Tubal Cain was the "instructor of every artificer in . . . iron" (Gen. iv. 22). The succession of the Stone, Bronze, and Iron Ages in Europe is well shown in the Swiss Lake Dwellings and in the burial-places of old Scandinavia. In the latter region the Iron Age seems to have commenced about 2,000 years ago, and to have lasted till Christian missionaries taught a higher culture with a purer faith.

Iron-bark, a name most generally applied to *Eucalyptus resinifera*, a large Australian tree with a hard bark, and a deep red, straight-grained, very hard and heavy wood, which is classed at Lloyd's as A1 for ship-building. From the stem Australian kino (q.v.) is also obtained.

Ironclads. [WAR-SHIPS.]

Iron-pyrites, the general name for the various mineral forms of iron-sulphide, so named from their having been formerly used instead of flint for striking a light. Of these, the two principal, *pyrite* and *marcasite*, both have the same composition, being bisulphides (FeS_2), giving off, when heated, fumes of sulphur, of which they contain 63 per cent., and ultimately fusing to a magnetic metallic bead. They also agree in hardness, being from 6 to 6.5. Pyrite crystallises in the Cubic system in cubes, pentagonal dodecahedra, or combinations of these forms, the faces being almost always distinctly striated parallel to the basal edges of the pentagons of the latter. It is brass-yellow, with a metallic lustre, often splendid, and a greenish streak; is perfectly opaque, even in thin sections; has a conchoidal fracture; and a specific gravity of 4.8 to 5.2. It resists the action of the weather, even after years of exposure. Marcasite crystallises in the Rhombic system; but occurs generally in aggregated masses known as *hepatic*, *cockscomb*, or *spear-pyrites*, sometimes forming rounded nodules of radiating fibrous crystals. It is a lighter brass-yellow than pyrite, whence it is sometimes called *white iron-pyrites*. Its specific gravity ranges from 4.6 to 4.9. It readily decomposes into iron-rust (hydrous oxide) on exposure to weather; so that the animal and vegetable fossils (q.v.), such as ammonites, cones, and fruits, which have often been entirely replaced by it, require protection from the ordinary moisture of the air, either by a marine varnish, or by being preserved in naphtha (that liquid containing no oxygen). It used formerly to be cut and polished as buttons, buckles, brooches, etc. Pyrite was employed in the old wheel-lock guns, a steel wheel revolving by clockwork against a piece of it, so that sparks fell into the pan, in which was some powder. Though, owing to the presence of sulphur, useless as ores of iron, both forms of pyrites are used in the manufacture of sulphuric acid, copperas, alum, and sulphur. Some pyrites contain gold in a proportion worth extracting. The "brasses" in coal are layers of pyrites, the nodular forms are common in the Chalk and Gault; the crystals of pyrite, in slate. *Magnetic pyrites*, or *pyrrhotine* (Fe_7S_8), crystallises in the Hexagonal system; has a coppery-brown tarnish, and a hardness of only 3.5 to 4.5, besides being magnetic and generally lighter than marcasite. *Arsenical pyrites*, or *mispickel* (q.v.), is rhombic, tin-white, with a coppery tarnish, and heavier than the others, besides giving off arsenical fumes.

Iron-stone, a general name for a number of ores of iron containing the oxides or carbonates, often with an admixture of sand, clay, limestone, or organic matter. They include the various more or less impure forms of hæmatite, limonite, siderite, clay-ironstone, and magnetite, which are here described under those separate headings.

Iron-wood, a name which, with its French equivalent *Bois de fer*, is applied to a considerable number of hard woods, belonging to various natural orders, but mostly natives of the tropics. Among them are various species of *Sideroxylon* (Sapotaceæ), *Metrosideros* (Myrtaceæ), *Eucalyptus* (q.v.), and

Olea; *Sloëtia sideroxylon* in the Malay Archipelago; and, in North America, the hornbeams, *Carpinus americana* and *Ostrya virginica*.

Iroquois, one of the main divisions of the North American aborigines, whose domain originally comprised the middle St. Lawrence basin with the shores of Lakes Ontario and Erie, the present State of New York and most of Pennsylvania, besides enclosures in Virginia, the Carolinas, and Tennessee, but nowhere quite reaching the Atlantic, being almost everywhere surrounded by various branches of their hereditary foes, the Algonquian people. The Iroquois proper, mainly centred in New York and the opposite side of the St. Lawrence, formed a renowned historic confederacy of five nations, afterwards (1712) increased to six by the accession of the Tuscaroras from North Carolina, the original "five nations" (*Ongwehonwe*, "Superior Men") being the *Mohawks*, founders of the union, the *Oneidas*, *Onondagoes*, *Senecas*, and *Cayugas*. The other branches of the Iroquoian race, some hostile, some friendly, were the Eries, "Neuters," and Wyandots (Hurons) of the lakes region; the Conestogas of the Lower Susquehanna, the Nottoways and Chowanoes bordering on the Tuscaroras, and the Cherokees of South Carolina. Physically the Iroquois were scarcely to be distinguished from their Algonquian neighbours, being of the ordinary Prairie Indian type; but mentally they were superior to them and to all other aborigines north of the Pueblo Indians (New Mexico and Arizona), as shown especially by their powerful political organisation, enabling them for generations to hold their own against all the surrounding Algonquians, by whom they were vastly outnumbered. They were also distinguished by their speech, a stock language of the normal polysynthetic type still spoken in several marked varieties on the reservations to which all the surviving tribes are now confined. They number about 43,000, of whom 34,000 are in the United States and 9,000 in Canada, the chief reservations being those of Indian Territory (Quapaw and other agencies), New York (Cattaraugus, Oneida, Alleghany, Tonawanda, and others), and Canada (Caughnawaga of Quebec, Quinte Bay, Grand River, and others of Ontario), besides the Green Bay Agency in Wisconsin for the Oneidas. The Eries, Conestogas, Neuters, Tionontates, and Wyandots are extinct. During the border warfare before the British conquest of Canada, the Iroquois usually took sides with the English, the northern Algonquians with the French. Since then the Iroquois have also accepted British culture, being mostly Protestants, and receiving instruction in English, while retaining the use of their several tribal dialects. They are of peaceful habits, and skilful agriculturists, raising much farm produce for the surrounding markets (Gallatin, in *Schoolcraft*, III. p. 401; Berghau's *Irokesen*, 1887; Bancroft, *History U.S.*, III. p. 243).

Irradiation is an effect of bright light on the retina of the eye. When a bright object is viewed its image is confined to a small area of the retina, but the effect of the disturbance of this area is not

quite confined to this limit. The neighbouring parts of the retina may also be disturbed, apparently by some sort of sympathetic action analogous to that of resonators in acoustics. Thus the brain receives the impression of an object larger than it actually is. This accounts for the greater apparent size of the sun when seen in a clear sky than when viewed through a fog. The thickness of the filament of an electric lamp when incandescent appears greater than when cold. Slenderness of a person may be disguised by white apparel, and *vice versâ*. The photograph of a lightning flash always makes it look much smaller than it naturally appears to be.

Irrational Numbers. [SURDS.]

Irtish, an Asiatic river famous for its sturgeon fisheries, which, rising on the south-west side of the Altai Mountains, forms Lake Zaisau and then flows into the government of Omsk. It then enters Tobolsk, passes the town of that name, and finally empties itself into the Obi, near Samarova.

Irulas. [ERULARS.]

Irving, EDWARD (1792-1834), founder of the sect of Irvingites, was born at Annan, Dumfrireshire, distinguished himself in mathematics at Edinburgh University; for several years he was employed as a mathematical teacher, until he became a licentiate of the Church of Scotland. After being associated with Dr. Chalmers at Glasgow in 1822, he became a minister of the Caledonian Asylum Chapel (Presbyterian), Cross Street, Hatton Garden. His eloquence and the eccentricity of his appearance, delivery, and doctrine, soon made him a most popular preacher, and his printed works were in great demand. In 1828 he formulated his peculiar tenets, and in 1830 proceedings were instituted with a view of turning him out of the ministry of the National Scotch Church. In 1832 he was deprived of the cure of the church in Regent's Square which his admirers had erected for him, whereupon his disciples bought the picture gallery of Sir Benjamin West, in which for about two years he promulgated his ideas.

Irving, SIR HENRY (b. 1838), theatrical name of JOHN HENRY BRODRIBB, the most distinguished actor of his day. He was born at Keinton near Glastonbury, came out in 1856 at Sunderland, acted Hamlet with *éclat* in 1874, and became lessee of the "Lyceum" in 1878. He was knighted in 1895. He died suddenly in 1905.

Irving, WASHINGTON (1783-1859), a famous and popular American writer, was the son of a considerable merchant of New York, where he was born. He was educated for the Bar, but being delicate made the tour of Europe from 1802 to 1806, when he returned to New York and was called to the Bar. In 1809 he brought out his *History of New York* (by Dietrich Knickerbocker), which established his reputation as a man of letters, and joined his brothers as partner in their mercantile firm, which, owing to the cessation of hostilities between England and the United States in 1814, became bankrupt in 1817, while Irving was in England. He then determined to devote himself

to literature as a means of livelihood. Making London his headquarters, he produced during seventeen years' residence in Europe *The Sketch Book*, *Brackenbury Hall*, *The Life of Columbus*, *Chronicles of the Conquest of Granada*, and *Tales of the Shannon*, etc. Returning to New York in 1832, he was welcomed with acclamation, and continued his career as an elegant and popular writer. From 1842 to 1846 he was United States ambassador at Madrid. He then resided until his death at Sunnyside, a residence on the Hudson, 25 miles from New York.

Isaac Comnenus (d. 1061), son of MANUEL COMNENUS, a celebrated general, was the first Byzantine Emperor of that dynasty. Left fatherless at an early age, he and his brother John were well educated under the care of Basil II., and advanced to high honour. The soldiers, disgusted at the effeminacy of Basil, soon elected Isaac emperor. He abdicated after a two years' reign owing to the decline of his health, and was succeeded by Constantine Ducas, his brother John refusing the honour. He died in a monastery.

Isabella (1451-1504), the famous Queen of Spain, was daughter of Juan II., King of Castile. In 1469 she was married to Ferdinand V., King of Arragon, and in 1474, on the death of her brother, Henry IV., she was chosen by the estates Queen of Castile, to the exclusion of her elder sister. Her husband established her in her kingdom by his victory over her opponents at Toro, in 1476; whereupon Ferdinand and Isabella assumed the styles and titles of King and Queen of Spain. With the assistance of Cardinal Ximenes she brought about the conquest of Granada and the expulsion of the Moors from Spain; while she exalted the royal prerogative and promoted public order by quelling the insolence of the grandees and restraining their petty wars against each other. This was effected by the maintenance of unbending personal dignity qualified by prudent graciousness, of rigid etiquette at Court, and of rigorous administration of justice. She was largely concerned in the introduction of the Inquisition into Spain (1480), and in the more beneficent transaction of tardily furnishing Columbus with the means of discovering America (1492). Her daughter and heiress Joanna was mother of the Emperor Charles V. Isabella was a woman of remarkable talent and of indomitable energy and resolution.

Isabey, JEAN BAPTISTE (1767-1855), a famous French portrait painter born at Nancy. He studied under Dumont and David. He painted portraits of Napoleon I. and Josephine, and of all the successive rulers of France up to the date of his death.

Issus (B.C. 420—abt. 348), one of the ten Attic orators, born at Chalcis, when still young went to Athens, where he studied oratory under Lysias and Isocrates. He established a school of rhetoric, and is said to have had Demosthenes as a pupil. It is supposed that he wrote, or helped Demosthenes to write, his speeches against his guardians. Nothing more is known of his life. Eleven orations remain out of the sixty-four with which he is credited. They

are on questions of inheritance, and throw much light on this branch of Attic law. His style is concise, clear, and forcible.

Isaiah (Heb. Jesaiah; flourished 8th century B.C.), the greatest Hebrew prophet, son of Amoz, was a citizen of Jerusalem, probably of high rank, since he addresses the king unbidden (vii. 4) and tells the most unpleasant truths without interference. He is supposed to have begun to prophesy about 740 B.C. He prophesied punishment for the people, sunk as they were in idolatry and unrighteousness, but declared that a remnant should remain, and foretold the coming of the Messiah. In ch. xxix.-xxxiii. he predicted the siege and deliverance of Zion, and in xxxix. foresaw the Babylonian captivity.

Isakkamaren (SAKOMAREN), a historical Tuareg people, the Segmaras of the early Arab writers, who in mediæval times occupied an extensive domain round about their stronghold of Tademekka, South Sahara. After the capture of this place, they were dispersed in various directions, some assuming the character of Marabouts (*anislamin*), while others sank to the condition of serfs to some of the noble Tuareg tribes. One group migrated northwards, and joined the Ahaggar confederacy in the capacity of traders on the caravan route between Twat and Ghadamas.

Isambert, FRANÇOIS ANDRÉ (1792-1857), born at Aunay, was a French lawyer. He began to practise as an advocate at the Court of Cassation in 1818, and speedily became known as a political advocate opposed to the Restoration Government. He gained much reputation by publishing *Recueil Général des Anciennes Lois Françaises, Code Electoral et Municipal*, etc. In 1830, after the July revolution, he was appointed councillor of the Court of Cassation and a member of the Chamber of Deputies. He belonged, till 1848, to the Constitutional Opposition, and showed himself friendly to liberty and hostile to the Jesuits. He also wrote *Histoire de Justinien*, etc.

Isandhlwana, or ISANDULA, 110 miles N. by W. of Durban, is on the left bank of the Buffalo river, in Natal. Here on January 22nd, 1879, 4 companies of the 24th and some native troops, under Colonels Durnford and Puleine, were nearly annihilated by 18,000 Zulus, the British loss being over 800, that of the Zulus 2,000.

Isar, a Bavarian river, rises in the Tyrol, N.E. of Innsbruck, and flows into the Danube near Deggendorf, after a course of 220 miles, passing Munich and Landshut. Much timber is floated down the Isar from the mountains.

Isatin. If nitric acid be added to a boiling decoction of indigo, the blue colour is gradually destroyed, and from the liquid can be crystallised out yellow prisms, which are soluble in water, alcohol, or alkali solutions, yielding in the latter a violet solution. These are *isatin*, a body of composition $C_8H_5NO_2$, and of the constitution represented by $C_6H_4 \begin{smallmatrix} \text{CO} \\ \diagup \quad \diagdown \\ \text{N} \end{smallmatrix} C.OH$. It is of very great chemical importance, as by means of suitable reactions indigo

may be prepared from it, and as it can also be obtained by numerous synthetic reactions, it affords the means of the complete synthesis and artificial preparation of this important dye; while otherwise also it is of great interest and importance in pure and applied chemistry.

Isauria, in ancient geography a district of Asia Minor on the summit and northern slopes of Mt. Taurus, inhabited by a savage race of robbers which died out after the 5th century.

Ischia, an island on the north of the Bay of Naples. The chief towns are Ischia, Casamiccola (destroyed twice by earthquakes, 1881 and 1883), and Jorio.

Ischl, a town in upper Austria, 33 miles E. by S. of Salzburg, on the river Traun, is famous for its saline baths, established in 1822. It manufactures 8,000 tons of salt every year.

Isère, a river which gives its name to a department in France, surrounded on the north and west by the river Rhone. Area, 3,200 square miles. The manufactures include iron and steel goods, gloves, cloth, straw hats, liqueur (chartreuse), etc. The capital is Grenoble.

Isidore, of Seville (560-636), a very celebrated ecclesiastic and compiler of glosses at the beginning of the 7th century, was born at Carthage, where his father Severianus was prefect, or at Seville. He succeeded Leander as Bishop of Seville (600). He presided at two half-ecclesiastical, half-civil councils at Seville (618 or 619), and at Toledo (633), when the bases of the constitution which lasted down to the 15th century were laid. In the eighth council at Toledo the title *egregius* was conferred on him for his great learning and devotion to literature. His most important work, *Originum sive Etymologiarum Libri xx.*, is an epitome of an encyclopædia.

Isinglass, a substance possessing the same composition as gelatine (q.v.), is obtained from the air bladder of various fishes. It comes into commerce as *pipe* or *purse* isinglass, which are merely the dried bladder; *leaf* isinglass, the opened bladder; or *ribbon* isinglass, cut into strips and rolled out. It is obtained chiefly from Russia, Brazil, and the Hudson Bay territory. It is employed for a variety of purposes. Large quantities are used for clarifying beers, light wines, and other liquids. Much of the best varieties is employed for confectionery, while it is also used for the manufacture of court plaster, marine glue, cements, etc. It is frequently adulterated with ordinary gelatine, and the detection of such fraud is only accomplished with difficulty and by careful examination.

Isis, in Egyptian mythology the Moon-Goddess, sister and wife of Osiris and mother of Horus, was daughter of Seb (the earth) and Nut (the sky). She was the patron goddess of women. Originally she was goddess of earth and agriculture. In art her attributes are the lotus flower as a head-dress, and the sistrum in her right hand. In Greece she was identified with Demeter and Io, and modified forms of her worship prevailed extensively. Her

worship with orgiastic mysteries was introduced into Rome in Sulla's time, and, in spite of the



ISIS.

opposition of first the Senate and then Augustus, became very popular.

Isia, JOSE FRANCISCO DE (1703-81), Spanish humorist, satirist, and preacher, early in life joined the Jesuits and lectured on philosophy and theology at Segovia, Santiago, and Pamplona. He became a famous preacher, and made still more sensation by his novel, *Friar Gerund* (1758), which was aimed at the charlatanism of the popular preachers of the day. He was struck with paralysis (1767). His works include *Youth Triumphant* (1727), *Letters of Juan de la Eucina* (1727), and a translation of *Gil Blas*.

Islay, an island in Argyllshire, has an area of 246 square miles, and lies 13 miles W. of Kintyre and half a mile S.W. of Jura. It contains several fresh-water lakes. The leading industries are dairy-farming, stock-raising, and whisky distillation.

Islington, a London suburb $2\frac{1}{2}$ miles N. of St. Paul's, forms part of the metropolitan area. It has many benevolent institutions. The National Cattle and Horse Shows are held in the Agricultural Hall, which will contain 50,000 persons. Since 1885 Islington has returned four members of Parliament, being divided into four constituencies. Pop. (1901), 334,906.

Ismaelites, the Bedouin or nomad element in Arabia, in contradistinction to the Kahtanides, or settled population, of Yemen; are traditionally regarded as *Arab el-Mostarebah*, that is, mixed Arabs, the issue of an alliance between Ismael and a woman of Kahtan stock. They are commonly known as Maadites, from Maad, a descendant of Ismael, and to this connection are referred the Nabothians, Kedarenes, Edomites (Idumeans), Amalekites, Moabites, Ammonites, and Midianites of the Biblical records. The Ismaelites hold the

Kahtanides in contempt, calling them *Ahl-el-Madar*, that is, "House People," because they dwell in towns and not in tents. Their speech is the classical language of the Koran and of Arabic literature, Mohammed having been an Ismaelite of the Koreish tribe.

Ismail, a town and river port in Russia. Formerly a Turkish fortress, it was taken by Suwaroff (1790), came into possession of Russia (1812), was assigned to Moldavia (1856), and transferred to Russia by the Berlin Congress (1878). Trade—corn, wool, tallow, and hides.

Ismailiyeh, a tribe occupying the eastern slopes of the Ansarieh Mountains, North Syria. They claim direct descent from the famous sect of the "Assassins," whose characteristic teachings they have, however, long ceased to practise.

Iso. [ISOMERISM.]

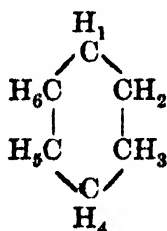
Isobars, in meteorology, are lines of equal atmospheric pressure. Barometric readings are taken at a large number of stations all over the earth; their average value at every station, during a certain interval, is carefully calculated; and lines are drawn on a map of the world, each line passing through those points where the pressure has been the same during the period specified. Study of these isobaric lines helps considerably in determining the cause of prevalent winds.

Isoclinic Lines, in magnetism, are lines drawn through those points on the earth's surface where the magnetic inclination is the same. Similarly *isogonic* lines show the points of equal magnetic declination, and *isodynamic* lines the points of equal magnetic intensity.

Isocrates (B.C. 436-338), one of the ten Attic orators born at Athens, was the greatest "epideictic" orator—i.e. a composer of show-speeches and model orations, to whom literary finish and form and rhetorical effect were all-important. He was the son of a wealthy flute-player, Theodorus, who gave him an excellent education, and when still young he studied under Tisias and the first epideictic orator, Gorgias, and also under the sophist Prodicus. He was not himself a public *speaker*, but wrote 60 speeches, of which 21 (8 only for law-courts) are extant. About B.C. 390 he began to teach rhetoric, and instructed a hundred pupils, amongst whom were Timotheus, Laodamas, Ephorus, Theopompus, Isæus, Lycurgus, Æschines, and Hyperides. His greatest speech, the *Panegyricus*, 380 B.C., claims supremacy in Greece for Athens. Isocrates was very impracticable, his one political idea being to unite the Greeks under Athens for an attack on Persia; and he was a zealous opponent of Philip of Macedon. He is said to have died of grief upon Philip's decisive victory at Chæronea.

Isomerism. Amongst chemical compounds there are numerous cases of two or more substances all consisting of the same elements in equal amounts, and therefore represented by the same empirical formula, but which nevertheless differ in their chemical and physical properties. Such

compounds are termed *isomeric*, and the difference is regarded as due to the difference in the arrangement of the atoms to form the molecules of the compounds. In some cases the difference may be very great, as, *e.g.*, in the case of *methyl ether* $(\text{CH}_3)_2\text{O}$, a gas only condensable at about 23°C ., and *ethyl* (or ordinary) *alcohol* $\text{C}_2\text{H}_5\text{OH}$, a liquid boiling at 78°C . In this case the compounds belong to quite different *types*, *i.e.* the *ethers* and *alcohols*. When the bodies are of the same type of compound the differences become less marked, as in the case of the *paraffins* (q.v.), known as *normal* and *iso*, in the former of which the carbon atoms are considered to form a straight, in the latter a branched chain, *e.g.* $\text{CH}_3\cdot\text{CH}_2\cdot\text{CH}_2\cdot\text{CH}_3$, and $(\text{CH}_3)_2\cdot\text{CH}\cdot\text{CH}_3$, normal and iso butane. In benzene compounds also a new form of isomerism occurs, sometimes called *position isomerism*, which depends upon the orientation of the groups united to the nuclear group. Thus if we number the hydrogen atoms in benzene (q.v.) as in the formula



and replace two of the hydrogens by another element, it is seen that three different *isomers* could result, in which the displaced were 1·2, 1·3 or 1·4, these three types of compounds being respectively termed *ortho*, *meta*, and *para* compounds. Another form of isomerism is known in which the chemical properties of the compounds are almost entirely similar, but they show differences in their action upon polarised light. This is often called *physical isomerism*, and only occurs in compounds in which at least one carbon atom is united to four different elements, or groups of elements, *i.e.* is an *asymmetric* carbon atom. The explanation received in these cases is that although the constitution as expressed by ordinary formulæ is similar, yet the compounds are related to one another in their structure, in the same way as an object and its image.

Isometric Projection is a method of drawing objects of simple shape so that their dimensions may be shown in one drawing, instead of requiring separate views of plan and elevation. It somewhat resembles perspective; vertical lines are represented vertical, and horizontal parallel lines are shown parallel (in perspective they are made to converge to a point).

Isomorphism. It was found by Mitscherlich, in 1819, that certain substances of analogous composition possessed the property of crystallising in similar forms. To this phenomenon he gave the name of *isomorphism*, and the substances were termed *isomorphous*. Those he studied first were the phosphate and arsenate of soda, but further study proving that other compounds of phosphorus and arsenic also exhibited isomorphism, the term got transferred from the compound to the element, and those elements are termed isomorphous which can replace

one another in compounds without alteration, or at least with but slight alteration of the crystalline form. Further, similar compounds of such elements should possess the power of crystallising together, yielding mixed crystals, which are of a form intermediate between those of the components. Many series or groups of isomorphous elements can thus be obtained, as the phosphorus group, the calcium group, etc. Some substances can crystallise in two or more forms, are *di-* or *poly-morphous*, and cases are known in which we may get *isodimorphism* *i.e.* minerals, as the oxides of phosphorus and arsenic, in which the two crystalline forms of the one are similar to those of the other. Isomorphism was for a time extensively used for the determination of the atomic weights, as the quantities of two elements mutually replaceable are proportional to their atomic weights, but owing to exceptions to this statement, the numbers were not trustworthy. Isomorphism also formed the groundwork for a large number of hypotheses and speculations regarding the nature and form of the ultimate particles of matter, or atoms, but none of them can be regarded as having contributed aught to our knowledge upon these points.

Isomya, one of the orders of the *Lamelli-branchiata*. [DIMYARIA.]

Isopoda, an order of Crustacea (q.v.) belonging to the Malacostraca, and forming with the Amphipoda (q.v.) the group Arthrostraca (q.v.). The three main characters of the sides are that the body is somewhat compressed from above downwards, that there are branchiæ (or gills) on the limbs of the abdomen, and that the head is distinct from the segment bearing the first pair of limbs. The order has been divided according to the mode of life into the Natatorial, Sedentary, and Cursorial groups. The first has a broadened abdomen, which acts as a swimming tail: most of these are marine, and some are parasitic upon fish. The Cursorial group is the one which is best known generally, as it includes the common wood-lice (*Oniscus*), notable from their habit of rolling up into a ball when threatened with danger. Many of the parasitic Isopods illustrate the phenomenon of degeneration, for they have lost the use of their eyes and antennæ (feelers): some, such as *Cryptoniscus*, have also lost all trace of the abdominal limbs, and even of segmentation.

Isothermal Expansion of a gas signifies expansion without change of temperature. The volume and pressure change together, but the law connecting them during isothermal expansion is different to that which holds when the gas is allowed to expand without gain or loss of heat. For a gas remote from its vapour condition, isothermal expansion is such that the product of its volume and its pressure remains always constant.

Isothermal Lines are lines drawn through those points on the surface of the earth, or any portion thereof, that possess the same average temperature during any given interval of time.

Isotropism signifies the state of complete

identity of the properties of a body in all directions from any point in it. An isotropic body is essentially homogeneous, but homogeneous bodies also include those that are termed *æolotropic*. Such have complete identity of properties at two different points, in the same direction, but the properties are not identical in all directions from the same point. Water is isotropic, rock-crystal is *æolotropic*; both are homogeneous bodies.

Ispahân, or ISFAHÂN, the capital of the province of Iraak Adjemi in Persia, stands on the banks of the Zenderud. The city is surrounded by groves, orchards, and cultivated fields. The fine buildings and bridges are much decayed, but of late years some have been renewed. It was formerly the capital of Persia, and was the emporium of the Asiatic world. It is the religious centre of Persia, as the chief Imam or High Priest resides here. It is likely to rise to importance again, as the main road from Mohammera to the interior passes it.

Israels, JOSEF (b. 1824), genre painter, born at Gröningen, studied at Amsterdam and in Paris under Picot and Henri Scheffer. In 1885 his *Prince William of Orange opposing the Decree of the King of Spain* attracted attention in the Exposition Universelle. He settled at Katwijk near Leyden, and more recently at the Hague. In 1867 he received a third-class medal and the ribbon of the Legion of Honour, and eight years after the cross and first-class medal.

Issy, a French village half a mile from Paris, connected with Paris by a tramway. There is a fort, a castle, and manufactories of chemicals. Here Blücher defeated Davout, July 3rd, 1815. The fort suffered severely during the Franco-German War, 1870-71, and has since been rebuilt.

Istamboul, the Turkish name for Constantinople, the capital of the Ottoman Empire.

Istria, an Austrian margraviate, forming a peninsula in the N.E. corner of the Adriatic, between the Gulf of Trieste and Gulf of Fiume. Though mountainous, it is often swept by the sirocco and bora winds. It yields olive oil and wine. The capital is Rovigno.

Italy. The *geographical* position of Italy is clearly defined by nature. The Alps form her northern boundary, the Mediterranean Sea washes her western, southern, and eastern shores. At the beginning of the Christian era Italy was the seat and centre of the great Roman Empire (q.v.). Rome had been the capital of Italy centuries previous to that time, and continued to be so for centuries after it. Throughout the Middle Ages it was the residence of that ecclesiastical power which sought to rule the whole Christian world, and did rule its most important section. Nor did the dismemberment of Italy, after the fall of the Roman Empire, deprive Rome of its high position even when the Italian republics of Venice, Florence, Pisa, and Genoa were playing their great part in European history.

In our own time Rome has been recognised as

the capital of a united kingdom of Italy, the seat of her government, and the keystone in the arch of her recovered unity and independence. In the present also, as in the past, Rome continues to be the residence of the ecclesiastic who governs the largest amongst the Christian bodies who form the outward branches of the Universal Church. Thus from every point of view the Italian capital seems to justify her right to the proud title of the "Eternal City." With its foundation (commonly



MAP OF ITALY.

dated B.C. 753) commences the *history* of Italy. That history extends over more than 2,500 years, during which she played for long centuries the leading part, and has always held a prominent position alike in the ancient and modern world; while to-day she is still an important factor in the life of Europe—a power whose alliance and friendship is sought even by the strongest governments of our time. Her weight in the councils of the nations is felt and acknowledged on all hands.

This present position of Italy is, however, of very recent growth, and forms not the least interesting portion of her long and varied history. At the close of the 18th century Italy was, as she had been ever since the first break of the Roman Empire, divided into several states, and her history up to that time must be sought under that of Tuscany, Lombardy, Venice, etc. She contained in 1795 the republics of Genoa and Venice, the kingdoms of Piedmont and Naples, the Milanese territory, subject to the House of Austria, the States of the Church, governed by the Roman Pontiff, and the duchies of Tuscany, Parma, Modena, and Lucca. Then came the revolutions and conquests caused by the wars and policy of the French under the first

Napoleon. He completely overthrew all the temporal powers of the Italian peninsula, and substituted for them governments of his own creation. Under one form or another Napoleon ruled the whole country. This continued until his overthrow in 1814, when the Italian governments established by him fell with him. In 1815 the treaties of Vienna restored the previous order of things, with the exception of the republics of Genoa and Venice. The former was incorporated with the kingdom of Piedmont, and the latter was handed over to Austria, who united her Milanese possessions to those of the ancient Venetian republic, and so formed the Lombardo-Venetian kingdom, which was placed under the direct rule of the Austrian emperors.

But this settlement was made without consulting the Italians themselves. It may have been satisfactory to the powers who signed the treaties of Vienna, but it lacked the consent of the governed. These latter were simply called upon to obey the orders issued. Thus was wanting, as subsequent events quickly proved, one of the necessary elements of stability in the condition of the peninsula. It was treated, to use the well-known phrase, only as a "geographical expression." But those who dispose of a people after that fashion are likely enough to learn to their cost that they are only preparing for themselves troubles and difficulties leading to revolutions and war, with all their attendant evils, instead of that quiet and order which they fondly fancied were to be the fruits of their policy. Within two or three years of the settlement effected by the treaties of Vienna Italy was in a thoroughly disturbed and disaffected condition. This is proved by the unimpeachable testimony of no less a person than Prince Metternich himself, the Austrian Minister. In his own account of the condition of the peninsula, written in November, 1817, he speaks of "the general dissatisfaction of the Italian States." Nor did matters improve as time went on. In the year 1820 a revolution broke out in Naples which compelled King Ferdinand I. to promise a constitution, which he gave. Having taken his oath to it, he proceeded to the Congress of Laybach, there, as he averred, to defend the constitutional government established in his kingdom. But instead of doing so he returned to his dominions with an Austrian army, overthrew the constitution, and re-established his former despotic rule. In the following year a revolution broke out in Piedmont, where a constitution was demanded at the hands of its sovereign, Victor Emmanuel I. But this was opposed by Austria and her allies of the so-called Holy Alliance, Prussia and Russia, who declared they would not allow any constitutional liberties to be granted. Victor Emmanuel I. abdicated in favour of his brother, Charles Felix, who was a strong supporter of absolutist rule. With the aid of Austria he put down the constitutional party in Piedmont. But he dispensed with that aid as soon as possible, for, though determined to rule as an absolute sovereign, he had no intention of placing his country under the control of a foreign power. In 1830 and 1831 revolutions broke out in Modena, Parma, and the

Romagnol provinces, of which Bologna was the capital, and which formed the northern portion of the Papal States. Austrian armies put down these revolts, and silenced all demands for constitutional government. Austria occupied Bologna with her troops, and France Ancona, thus maintaining by force the temporal power of the Pope, which was of a purely autocratic type. Plots, conspiracies, and outbreaks were constantly occurring throughout the peninsula, the then governments of Italy meeting them with military rule, exceptional laws, and severe repression. The ferment of discontent driven below the surface only increased. The Carbonari and other secret sects were hard at work. Now began the indefatigable propagandism of Mazzini in favour of a united Italian republic. "God and the people" was his famous watchword. A man of remarkable character, of blameless private life, of indomitable energy, of absolute devotion to the idea of Italian liberty, he gathered multitudes of followers from all sections of Italian society. Men of the people like Garibaldi quickly joined him who were willing to risk all, including life itself, in attempts to overthrow the existing order of things by an appeal to arms. He had, too, plenty of followers among the wealthy and upper classes. Nor were there wanting men who declared even assassination allowable in the effort to rescue Italy from her intolerable bondage. As years went on this violent antagonism increased, and Italy became a veritable hot-bed of revolution. Such were the fruits of the policy adopted towards her by the statesmen who drew up the treaties of Vienna. This short-sighted policy, instead of producing as they had hoped order and contentment, resulted in discontent and revolution, culminating in violent repression, violent resistance, and even criminal outrage. At the same time that large class of moderate but determined reformers, of whom Balbo, Gioberti, Montanelli, D'Azeglio, Farini, Poerio, Settembrini, Durando, Ricasoli, Capponi were noble types, appealed aloud, but in vain, for such reasonable reforms as would at least ameliorate the condition of their unhappy country. Amongst the men of this class was one still unknown beyond the circle of his own friends, who was destined to take a foremost place not only among the liberators of Italy, but among the European statesmen of the 19th century—Camillo Cavour.

It was while this ferment of liberal and patriotic feeling was leavening the whole country that Pope Gregory XVI. died on the 1st June, 1846. On the 16th of that month Cardinal Mastai-Ferretti was elected in his place, and took the title of Pius IX. He was a man of kindly disposition and enlightened tendencies. He had been Bishop of Imola, and entered with no little warmth while there into the ideas of his friend and neighbour Count Pasolini, himself a member of the reforming party. The Count's memoirs, written by his son and translated by the Dowager Countess of Dalhousie, give an interesting account of the interchange of ideas between this Italian nobleman and the then Cardinal Bishop Mastai-Ferretti. The latter had read D'Azeglio's *Condition of the Romagna*, Gioberti's *Moral and Civil Supremacy of the Italians*, and

Balbo's Hopes of Italy. He felt a lively sympathy with the views of these Italian statesmen and patriots, and expressed wonder that the Court of Rome could be so often averse to such reasonable changes as were naturally demanded by the inevitable progress of civilisation and knowledge. Such was the pontiff who now mounted the Papal throne, and occupied it for a greater length of time than any of his predecessors—from June, 1846, to February, 1878. He inaugurated his reign by a general amnesty extended to all who had been condemned for political offences. In the following year (1847) a Council of State was instituted into which a lay element was introduced. These and similar measures were received with great satisfaction, and had a decided effect in strengthening the liberal tendencies of the courts of Turin and Florence. But throughout the peninsula there was stirred up another feeling, naturally arising from the liberties already given, the national desire to free Italy from foreign rule—in other words, the exclusion of Austria from the peninsula. The great mass of Italians were bent upon it, but the only sovereign who was willing actively to pursue such a policy was Charles Albert, King of Piedmont. An unlooked-for event precipitated this great question into the arena of practical politics. It was the French Revolution of February, 1848, followed by that in Vienna some six weeks later. Then Milan and Venice rose in arms against the Austrians. After five days' fighting the capital of Lombardy became free, Marshal Radetzky leaving the city and falling back on Verona. Venice, too, won her independence, and placed one of her most illustrious sons, Daniele Manin, at the head of her restored republic. The Dukes of Parma and Modena had to leave their states. After a momentary hesitation Charles Albert threw himself into the national movement, and issued a proclamation on the 23rd of March, 1848, in which he promised to come to the aid of the Lombards and the Venetians. He accordingly crossed the Ticino, and so began the war with Austria. The Grand Duke of Tuscany joined his forces to those of Piedmont, and Ferdinand of Naples was compelled to do the same, but took the earliest opportunity of recalling them. He violated the constitution he had given, and betrayed alike the liberties of his subjects and the national cause. The enthusiasm throughout Italy knew no bounds, but the Papal Government was in great difficulty as to what course to take. At first the Papal army was called out, but only to defend the Papal territory. This, however, by no means satisfied the feeling of the country. Loud was the demand that the Roman forces should unite in actively assisting the war in Lombardy and Venetia against Austria. The Pope hesitated, but at length on the 29th of April, 1848, he held a consistory in which he pronounced an Allocution declaring he would not join in the war against Austria. It was a terrible blow to the national cause, but it was a yet heavier one to the Papal temporal power, for thereby it was placed in direct antagonism to Italy's national wishes. From that hour Italy lost all confidence in the Pope as a temporal ruler. He, indeed, would willingly have

persuaded Austria to give up her Italian possessions, but her rulers would not at that time entertain such an idea even for a moment. The war went on, ending in the complete triumph of Austria, the defeat and abdication of Charles Albert, King of Piedmont, the restoration of Austrian rule in Lombardy and Venetia, accompanied by absolutist governments, in Parma, Modena, Tuscany, the Papal States, and Naples, duly supported by the power of Austria, except in Rome, where French troops upheld the temporal sovereignty of the Pope. From that time to its fall foreign support became absolutely necessary to its existence.

There was, however, one, but only one, among the Italian states where despotism did not triumph. It was the kingdom of Piedmont. Charles Albert had been succeeded by his son, Victor Emmanuel II., in whose favour he had abdicated on the battlefield of Novara, where Marshal Radetzky won a signal victory on the 23rd of March, 1849. The new king commenced his reign amidst the greatest difficulties, but nothing could induce him to swerve from the constitution granted to the Piedmontese by his father. To that he took his oath, and that oath he kept with a faithfulness which soon won for him the title of "*Il re galantuomo*." He was greatly aided by the loyal support of the Piedmontese, who were both devoted to the House of Savoy and resolved to uphold the constitutional freedom given by their late sovereign and confirmed by his son. The latter had also at his command one of the noblest bands of constitutional advisers who ever served any sovereign or any country. Soon the ablest among them, Count Cavour, assumed the conduct of affairs. He quickly proved himself to be one of the greatest statesmen in Europe. From 1849 to 1859 this little kingdom of Piedmont maintained with splendid courage and success, despite great difficulties, complete civil and religious freedom, while constantly vindicating, both by her example and by her diplomatic action, the principle that Italians had the right to national independence and capacity to use and maintain it if only left to do so without foreign interference. The internal order and liberty of Piedmont were an incalculable help to the cause of Italian freedom. It gave also to Italy a chief around whom all could rally with absolute confidence. Victor Emmanuel inspired no less trust in the hearts of statesmen like Cavour than he did in the hearts of leaders like Manin, the ruler of Venice, and Garibaldi, the popular idol of his country, both of them men of the purest patriotism, both republicans in theory, and both implicitly trusting, and justly trusting, the king. That trust was complete, universal, and deserved. He proved himself worthy of it in every action of his political life, from the day of his accession on Novara's field to the hour of his death in Rome as King of Italy.

The war of 1859, when Napoleon III., Emperor of the French, joined his armies to those of Victor Emmanuel, resulted in giving Lombardy to Piedmont, but it also enabled the other peoples of Italy to show whom they desired to rule over them, because the French Emperor, then at the height of his power, declared that, whatever might be his

wishes, or those of other sovereigns, the Italians should be free to make their own choice. Parma, Modena, and Tuscany speedily voted their annexation to Piedmont. The people of the Papal States did the same, except in Rome and its immediate territory, where the French Emperor maintained the last remnants of the Papal temporal power. In the meantime a revolution had broken out in Sicily against the rule of the Neapolitan Bourbons. Garibaldi, ever ready to fight for his country's freedom, went there, despite all opposition and advice, and speedily overthrew the Bourbon Government in Sicily and Naples alike. The Italian troops under Victor Emmanuel himself advanced quickly to Naples, close to which the king and popular chief met, and so the whole of Italy and Sicily became a united kingdom under Victor Emmanuel. Venetia and Rome with its small territory alone remained under foreign rule. The newly-formed kingdom of Italy joined Prussia in 1866 in her war against Austria, and though the Italians were defeated at Custozza, her good faith as an ally, and her services in having obliged Austria to maintain 100,000 men in Venetia, were rewarded by the addition of that province to the kingdom of Italy. Yet it may with truth be said that Austria herself gained greatly by the events of 1859 and 1866, for by them she got rid of her absolutist system in Church and State, broke away from the Concordat of 1855 with the Vatican, and, as the Austro-Hungarian monarchy, was endowed with constitutional freedom. Having become reconciled with Germany and Italy, she has secured by alliance with them an assured position against foreign aggression, and has now in Italy a friendly neighbour instead of a bitter foe. Justice and freedom have knit the two nations together by ties of friendship.

In 1870, with the fall of the second French Empire, fell the temporal Papal power which that empire upheld. Then Rome became the capital of Italy and the seat of her government. In January, 1878, King Victor Emmanuel died, and was buried in the "Eternal City" as the sovereign of United Italy acknowledged by all the powers of the world. He was at once succeeded by his son, King Humbert I., whose accession took place not only without difficulty but as easily as if the House of Savoy had reigned over the country, with Rome as its capital, not for eight or eighteen years but for eighteen generations, so strong and so unanimous was the devotion of the whole nation to that royal house which had done so much for Italy's unity and freedom. But it has not been without great efforts and sacrifices that Italy has attained to her present position. To get rid of the system imposed upon her by the treaties of 1815, and, having freed herself from it, to establish a system of free government in the place of five or six despotic rulers, was a task of no slight difficulty. It was greatly lessened by having ready to hand in Piedmont institutions which could, with certain modifications, be applied to the whole peninsula. In 1900 Humbert was assassinated by an anarchist, and was succeeded by his son Victor Emmanuel.

Constitution.—Italy is now ruled by a constitu-

tional sovereign, with a Senate or Upper House whose members are nominated for life by the king on the advice of his responsible ministers, and a Lower House chosen by the electorate. In the 1909 election 346 ministerialists were returned, as against an extreme left of 103 and 59 of other views. An elector must be twenty-one years of age, able to read and write, and paying direct taxation.

The *population* of the whole country, including the islands of Sicily, Sardinia, and Elba, was, in 1908, 33,910,000. In 1865 the same civil, commercial, and administrative legislation was extended to the whole country. The commercial code was further reformed and improved in 1883. The judicial and administrative systems were reformed in 1888-90, but it was not until 1890 that the new penal code, after long and mature studies, came into force. One formidable difficulty against which the new order of things had to contend was the gross ignorance of the population, more especially in central and southern Italy. It was found in 1863 that something like 77 per cent. of the population could neither read nor write, and in the old Papal and Neapolitan States the percentage rose to 85 and even 90. Such was the legacy of crass ignorance left by the governments now happily overthrown. It was no easy task to change this state of things, but much has been effected towards it, though not a little still remains to be done. By 1892 a government primary school had been established in every commune, and 2,400,000 children were under instruction. The annual expenditure on education has reached £2,500,000 sterling, while the average of those who were unable both to read and write had been reduced to 35 per cent., showing, however, what need there is for still further exertions. The law of July, 1904, imposing special disabilities on the illiterate, has been a great stimulus, and both higher and technical instruction have also made great advances. Teachers are now better paid, and an old age fund has been existent since 1878.

Brigandage had been rife for generations in Italy, and had become almost a recognised institution, with which the old governments not unfrequently made terms. It has now been reduced to very narrow limits, though still showing itself from time to time. Like the "Camorra" and the "Mafia," secret societies for the extortion of blackmail, these criminal legacies of an evil past die slowly, but surely, as civilisation and enlightenment take the place of the lawlessness and crime which fostered these nefarious organisations.

Italy has had, and still has, to bear heavy financial burdens. In 1863 she had a deficit of 400,000,000 francs or £16,000,000 sterling. Not until 1875 did she reach an equilibrium as between her income and expenditure. Her public funds had been as low as 50—they at length rose to nearly par. Up to 1885 she maintained her equilibrium. Since then, chiefly owing to those increased armaments which are the incubus and terror of every European exchequer, the expenditure has exceeded the income of the country. Efforts are being made once again to restore that

equilibrium, not without hope of success. In the 1909 Budget estimates the public revenue was given as £81,094,545, and the expenditure as £79,359,133, plus interest on public debt of £19,458,637. Her resources increase, though slowly, owing to her heavy taxation. The People's Banks, "Banche Popolari," of which Signor Luzzatti was the moving spirit, and the "Casse Rurali," or Rural Banks, formed to meet the needs of the small rural cultivators by Dr. Wollemborg, have been sources of great help to the poorer classes in town and country. Thereby not only have these latter been able to borrow at a low instead of a usurious interest, but they have laid by considerable sums in consequence, showing great thrift. These useful institutions have without exception stood their ground during periods of panic and depression, and are extending more and more their beneficent operations. Italy possesses, and no doubt needs in the present circumstances of Europe, a formidable and well-equipped army and navy, which make her a useful ally and a power with whom all others must reckon. But her progress is unquestionably hampered by the heavy expenditure those forces entail upon her people.

The principal agricultural *produce* of Italy consists of wheat, Indian corn, oats, barley, rice, hemp, flax, wine, olive-oil, and silk cocoons. Large dairy farms exist in various provinces of Italy. In general the land is much sub-divided. *Factories* are on the increase, among which there are many silk factories. In 1882 the weight of the cocoon harvest was 70,000,000 lbs.; in 1908 it had reached about 100,000,000 lbs., and still increases.

The forestry department is under the Ministry of Agriculture, with a council of forestry, and is now carefully attended to; the yield is from 90 to 100 millions of lire or francs annually. The mineral wealth of the country consists chiefly of iron, zinc, and lead ores, sulphur, salt, graphite, and boric acid. The value of the principal mineral products in 1907-8 was a little over 61,000,000 lire or francs.

The quarries of Italy, especially those of marble, are very valuable, the annual output being estimated at one million sterling. There has been a very marked and rapid industrial development in recent years, especially during the present century, and the total value of her imports and exports has increased. Poultry and dairy farming for export are making great progress. There is also an increasing export trade in fresh fruit.

Literature. The history of literature in Italy is in some respects peculiar. The fact that we use two different names for the language, and consequently for the literature of the same country and the same people according to the age which we are considering, is of itself sufficient to mark the case as unique. Alfred the Great and Alfred Tennyson, with a thousand years between them, alike called their language "English;" Homer and Tricoupis, with more than two thousand, both wrote Greek. But though less than eight hundred years separate Boethius and Dante, we call the *Consolations of Philosophy* Latin, and the *Divine Comedy* Italian. This division of the language used by men of the same land and the same race serves to simplify

considerably the task of the historian of Italian literature. Until the year 1200 or thereabouts, the language which we now call Italian, and which represents rather the colloquial than the, hitherto, written speech of Italy, cannot be said to have had a literature. Doubtless there must have been popular ballads, satirical and amatory; but no one thought to write them down. In the north of Italy the language was slowly differentiated from Provençal: and it is in Sicily that the first outburst of real poetry seems to have taken place. Ciullo of Alcamo, near Palermo (ca. 1200), and the Emperor Frederick II. (1194-1250), who was perhaps more at home in Sicily than anywhere else, have left charming love poems. Before the end of the 13th century the spirit of poetry was abroad throughout Italy. In Rossetti's *Dante and his Circle* will be found the names of over forty writers belonging to this period, some of whom have left lyrical poems of a high degree of merit. Among them are the names of Guido Guinicelli of Bologna, Guittone of Arezzo, who, if not the inventor of the sonnet, is thought to have given it its final shape, Jacopo of Lentino, another Sicilian, and Dante's friends, Guido Cavalcanti and Cino of Pistoia. Of prose literature we find as yet but little. The greatest work of the age, Brunetto Latini's *Trésor*, a kind of encyclopædia of all learning, was written by him in French, because "it was most common to all people": and a history of Venice is said to exist, written in the same language. Before the end of the century, however, DANTE ALIGHIERI (q.v.) had written his *New Life*, and early in the following century his *Banquet*, in the latter case with arguments in favour of the use of the "vulgar tongue." In his *Comedy*, in the form in which we have it, written probably between 1310 and his death in 1331, Italian literature reached at one bound its highest level. The 14th century, or, as the Italians call it, the "Trecento," gave birth to other works, which though far inferior to this supreme achievement of genius, are hardly less superior to anything which the language has since produced.

FRANCIS PETRARCH (q.v.) (1304-1374), better known in his own day as a scholar and writer of elegant Latin, has earned immortality by a sequence of sonnets and odes, which form a tiny fraction of the mass of his published writings. JOHN BOCCACCIO (q.v.) (1313-1375) may be regarded as the father of Italian prose. His collection of stories, known as the *Decameron*, though occasionally dealing with subjects which decent writers now leave alone, contains many very beautiful tales told in admirable language. His other imaginative works are less interesting, though equally models of style; but his commentary on Dante, of which not more than one-sixth was written, is of great value. FRANCO SACCHETTI (1335-ca. 1400) was another teller of short stories; and FAZIO DEGLI UBERTI, somewhat senior, wrote a long and ponderous geographical treatise, called *Dittamondo*, the chief merit of which is that it shows him to have been a diligent student of Dante.

More nearly contemporary with Dante was John Villani (ca. 1275-1348), whose *Florentine History* it is hardly too much to say, is the most fascinating

work of the kind since Herodotus. His task was continued by his younger brother Matthew and his nephew Philip. The revived study of the ancient languages, especially of Latin, which reached its highest development towards the end of the 15th century, did grievous harm to vernacular literature in Italy. All the serious literary efforts seem to have been devoted to the discovery and imitation of the ancient masterpieces; the age became thoroughly sceptical, and its literature reflects its mood. The strongest Italian work of the "Quattrocento" is burlesque, whether, as in the case of Pulci's *Morgante Maggiore*, avowed, or as in that of Boiardo's *Orlando Innamorato*, and Ariosto's *Orlando Furioso*, half concealed under more stately diction. Towards the end of the century a greater name, the greatest we may say after Dante, appears in NICOLAS MACCHIAVELLI (q.v.) (1469-1527). In his chief works, the *History of Florence*, the *Discourse on the first Decade of Livy*, the *Prince*, he gives the first example in modern times of the critical study of history and politics. His somewhat junior contemporary, Francis Guicciardini (1482-1540), wrote a *History of Italy*, which, though it became a by-word for tediousness, is an important contribution to our knowledge of the times. Meanwhile the "novella" or short story continued to flourish; and most men of letters tried their hands at it. The most famous names of the period are Cintio Giraldis and Matteo Bandello. Both these have the honour of having supplied themes to Shakespeare. The last Italian poet, it may be said, who has survived to the present day is Torquato Tasso (1544-1595). He has been termed "the poet of that new and undefined emotion which we call sentiment," and *Gerusalemme Liberata* is read to this day, at all events by students of the language. The seventeenth century produced, except for some of Redi's poems and Tassoni's coarsely humorous burlesque *La Secchia Rapita*, little in the way of poetry save bad taste. The *Pastor Fido* of Guarini (1587-1612), though not devoid of elegance, is full of conceits and affectations; while the *Adone* of Marino (1569-1625) set the fashion which has earned for the Italian *Seicentisti* the reputation of the worst school of poetry that the world has ever seen. Towards the close of the century, however, patriotic feeling inspired somewhat better work in Filicaja (1642-1707). History still held its place; and Father Paul Sarpi's (1552-1623) *History of the Council of Trent*, first published, by the way, in England, ranks among the greatest works of its class. During the 18th century the literary activity of Italy found its outlet chiefly in the drama. The plays of Carlo Goldoni (1707-1793) and Vittorio Alfieri (1749-1803) still hold the stage; the latter, indeed, being the most vigorous writer whom Italy had produced for many generations. Pietro Trapassi, who called himself Metastasio (1698-1782), wrote a great number of dramas, adapted to musical setting, and containing many graceful lyrics; and Carlo Gozzi (1720-1806) maintained the old Italian style of farcical comedy against the "comedy of character," introduced by Goldoni. In the nineteenth century science and criticism, rather than pure literature, claimed the best intellects of Italy, and much of her energy was

occupied in the task of making herself a nation. The most famous name is Alessandro Manzoni (1785-1873), poet, dramatist, and novelist. In the latter capacity he came strongly under the inspiration of Scott, which indeed produced a school of novelists, among whom Tommaso Grossi may also be noted.

In poetry the chief names of the century were probably Giacomo Leopardi (1798-1837), Giuseppe Giusti (1809-1850), Enrico Panzacchi (1841-1904) and Giosuè Carducci (b. 1835). The most recent Italian school of poetry appears to cultivate vehemence of expression rather out of proportion to its intrinsic poetical merit. Good work has been done in history by Michele Amari (b. 1806) and Pasquale Villari (b. 1827). Giuseppe Mazzi (1808-1872), though best known as an active politician, left a considerable mass of writing chiefly on political and social subjects; and Count Angelo de Gubernatis (b. 1840) has touched literature at almost all points. In fiction Italy has chiefly to depend upon translations from French and English, but some good original work has been done by Matilde Serao, Giovanni Verga, Edmondo De Amicis, d'Annunzio, and Antonio Fogazzaro.

Ethnology. At the dawn of history Italy has already been long divided into four distinct ethnic zones: 1. The basin of the Po and surrounding valleys occupied by a heterogeneous population of Ligurians, Teutons, Slavs (Venedi, Wends), and Celts, these last being dominant, whence the expression, *Gallia Cisalpina*, applied to the whole region. 2. Etruria and some neighbouring districts, home of the Etruscans. 3. Umbria, Sabina, Latium, Campania, Samnium, domain of the Italian peoples proper. 4. Apulia, Lucania, Bruttium, that is, all the southern provinces, with Sicily, inhabited by a substratum of Iapygians, Messapians, Siculi (Siculi), and other aborigines, everywhere dominated by intruding Greek settlers, whence the expression *Magna Græcia* applied to South Italy. Some of these peoples, such as the Ligurians, Etruscans, and Sicani, were of uncertain origin; but the great majority were certainly Aryans, mainly of Celtic, Italic, and Hellenic branches. Nearly all the later intruders—Longobards and other Teutons towards the close of the Western Empire, Normans in the 11th and 12th centuries, Albanians and Neo-Greeks after the fall of Constantinople—we also Aryans, so that the immense majority of the present inhabitants must be regarded as of Aryan origin, as all have for about 2,000 years been almost exclusively of Aryan (Italic) speech. Hence certain uniformity of type, by which the Italian with much local diversity, may be readily distinguished from the inhabitants of the Iberian peninsula, and other south Europeans more largely affected by non-Aryan elements. But the dualism pervading the whole of the Aryan world—[ARYAN RACES] exists also in Italy, where grey or blue eyes, fair or chestnut hair, florid complexion, and tall stature prevail in the north, while black eyes and hair, somewhat sallow complexion, and medium or low stature are dominant in the central and southern provinces. Dr. Beddoe, however, distinguishes five sub-types: 1. The Venetic

essentially Slav"; 2. The Piedmontese, Celtic; 3. The classical Roman, still prevalent in Latium; 4 and 5. North and South Neapolitan. (Dr. J. Beddoe, *On the Physical Character of the Natives of some parts of Italy*, in *Transactions of the Ethnological Society*, 1861.)

Languages, Italic, a main division of the Aryan linguistic family, comprising the extinct Umbrian, Volscian, Sabine, and Oscan, of which but scanty remains have survived, and the Latin of Latium, which, with the spread of the Roman Empire, became for centuries the dominant language of west Europe and north Africa. After the fall of the Western Empire, Latin still remained the vernacular everywhere except in Britain and Africa, gradually passing through various degraded forms into the Neo-Latin or Romance languages of the modern "Latin world." These are chiefly: 1. *Italian*, with numerous marked dialects, of which the *Tuscan* has become the literary standard; 2. *Langue d'Oc* of south France; 3. *Langue d'Oïl* of north France (standard French); 4. The *Spanish* group of dialects, of which *Castilian* has become the standard; 5. *Portuguese*; 6. *Rumanian* of Moldavia, Wallachia, and the Pindus Mountains, Balkan Peninsula; 7. *Rhaeto Romance* (Ladin) of parts of Switzerland and Tyrol; 8. *Walloon* of east Belgium. All these are derived independently, not from the classic Latin of literature, but from the *lingua rustica* or *sermo campestris*—that is, the Roman rude colloquial forms current in the several provinces, afterwards cultivated and enriched by borrowings from the classic tongue. The tendency has everywhere been to substitute particles and auxiliaries for the Latin grammatical endings, and this tendency has resulted in the total disappearance of the old declension, of the neuter gender, and of a large part of the old conjugation, with fresh synthetic formations in one or two instances. Thus the future *amabo* first became colloquially *amare habeo*, and then *amare ho*, *amerò* (Italian), *amaré* (Spanish), *aimerai* (French), and so on. The remarkable uniformity with which this process has been carried out over a vast linguistic area, ranging from the Danube delta to the Atlantic seaboard, is explained by the great antiquity of the analytical forms (*amare habeo*, *scriptum habeo*, etc.), which were already features of the *lingua rustica* in Italy at a date previous to the founding of the military and other colonies in Gaul, Spain, and other distant provinces of the empire. Hence these forms everywhere entered into the structure of the Neo-Latin languages, all being the direct issue of colloquial Latin.

In the Aryan system the Italic group appears to occupy a position somewhat intermediate between the Celtic and the Hellenic, though the separation took place at such a remote epoch that the relations of the several branches to the parent stem and to each other are now obscured. In some respects, and especially in its phonetic system and declension, Italic is more archaic than Hellenic. Thus Latin retains the ablative and traces of the locative case, both long lost in Greek. It also preserves the organic initial *s* before vowels, which in Greek becomes an aspirate, as in *ἑξ* = *sex* = six; *ἑλς* = *sal* = salt. But on the other hand the Latin conjugation

has been largely recast, while rhotacism (change of *s* to *r*) has made large inroads, already noticed in the old Umbrian, Oscan, and early Latin. Thus: *genus, generis* for *genusis*; *amantur* for *amant-se*, etc. But Latin preserves the *k, qu*, which becomes *p* in Greek and later Celtic, as in *quinque* = Irish *coic* = Welsh *pump* = Greek *πέντε* = five. The Latin phonetic system is mainly preserved in the Romance tongues, with a change of gutturals to palatals in some instances (French, *chien* from *canis*; Italian, *cinque* from *quinque*), and in Spanish more extensive modifications, due, perhaps, to Arab influences (comp. *hijo* with *filius*). In the New World Spanish ranks in importance next to English, being the language of culture for all the mixed populations of the Hispano-American republics, as Portuguese is for those of Brazil. French is mainly confined to lower Canada, parts of Louisiana, Algeria, and the islands of Mauritius and Réunion in the Indian Ocean. All the other Romance tongues are restricted to their respective European domains, though Rumanian has followed the migratory movement of the Wallachians into Hungary. Altogether the Italic languages are spoken by about 170,000,000 of human beings.

Itch or SCABIES. A skin disease produced by a parasite which, if allowed to develop in the epidermis of the skin, burrows extensively, producing an eruption which is accompanied by intense irritation. The itch mite, or *acarus scabiei*, somewhat resembles a cheese mite; it can only just be detected with the naked eye, but is readily visible on using a lens. The parts affected with special frequency are the wrists, palms, and interspaces between the fingers. The eruption produced consists of papules or vesicles, sometimes pustules. Treatment consists in the daily use of hot baths with plenty of soap, and the rubbing in of sulphur ointment with a view to destroying the parasite.

Ithaca, now THIAKI, is the smallest of the Ionian Islands except Paxos. It lies twenty miles west of the mainland of Greece. Its area is 37 square miles. Wine, currants, and olive oil are grown. Sponges and coral are fished for. The chief town is Vatny. It is famous as the country of Homer's Ulysses.

Ivan [JOHN], the name of four Czars of Russia, of whom IVAN IV. (1530-84), known as IVAN THE TERRIBLE, is the most famous. He reigned from 1533, did much for arts and commerce, and extended his dominions by arms. He concluded a treaty with Queen Elizabeth in 1553. He conquered Kazan and Astrakhan and annexed Siberia. He showed no mercy to the *boyars* and cruelly oppressed some of the towns of his kingdom, such as Moscow, Jven, and Novgorod (where 60,000 people were slain in six weeks). In a mad fit in 1581 he slew his son.

Ivanovo, a town in Russia, in the Government of Vladimir, has been the centre of the Russian cotton industry since the middle of the 18th century.

Iviza, one of the Balearic Isles, 56 miles from the Spanish mainland. Area, 228 square miles. Chief town, Iviza. The products are salt and fruit.

Ivory. [ELEPHANT.]

Ivory black is a pure variety of animal charcoal, which is obtained by calcining ivory shavings in iron retorts, much in the same manner as bone black is derived from bones. Ivory black is extensively used as a pigment, and for production of Indian and Chinese ink.

Ivory, Vegetable. [COROZO-NUT.]

Ivry, a village in the department of Eure in France, 16 miles N.N.W. of Dreux. The famous battle between Henry of Navarre and the armies of the League was fought on the plain of Ivry (March 14th, 1590). The population is 1,100.

Ivy, a genus of evergreen climbing shrubs with scattered simple exstipulate leaves, a simply umbellate inflorescence of symmetrically pentamerous flowers, and a globular five-chambered baccate fruit. They have an epigynous disk and a slightly ruminated albumen. The genus, known botanically as *Hedera*, is the type of the order Hederaceæ, and the numerous recorded species, native to the Old World, may be reduced to three. *H. helix*, the common ivy of Europe, is a variable plant. It climbs on rocks, trees, or walls by means of numerous adventitious rootlets or claspers (French *cramppons*), and its stems, which have a thick cork, may reach 10 inches in diameter. The leaves on the climbing part of the plant are three- to five-lobed, and it is not until it reaches the top of a tree or wall that the plant bears any flowers. Before doing so it branches horizontally and bears ovate unlobed leaves. The flowers are greenish, and on their stalks and calices have stellate hairs. The berries are black or rarely yellow. The plant is in no sense a parasite, but has an injurious mechanically constrictive action on tree-stems. On sound walls it promotes dryness or warmth; but if its shoots penetrate between stones or bricks its growth will overthrow the building.

Ixion, in Greek mythology, father of Pirithous, king of the Lapithæ. Zeus took Ixion to heaven to purify him after his treacherous murder of his father-in-law, Deioneus. He attempted to seduce Hera, but was tricked by a phantom made by Zeus to resemble her, and begat the original Centaur. Hermes bound him hand and foot to a wheel, which revolved for ever in the sky.

J.

J, the tenth letter of the English alphabet. At one time it was used indiscriminately with *i*, and in Latin *i* was used both for *i* and *j*, and had both the vowel sound of *i* and the consonant sound of *j*. Now *j* has only the *dzh* sound.

Jabalpur, (1) the name of the northern division of the Central Provinces, Hindostan, and also of a district in the division. (2) The town of Jabalpur is an important railway and commercial centre. The manufacture of cotton is the chief industry.

Jabiru, any species of *Mycteria*, distinguished from the Storks by having the bill with a slight



JABIRU.

upward curve. There are four species from Africa, India, Australia, and the Neotropical region. They are often called Giant Storks. [STORK.]

Jablochkoff's Candle, now practically obsolete, was an electric arc-lamp composed of two parallel rods of carbon placed side by side, separated by a thin layer of kaolin or Chinese clay. A rapidly alternating current was sent up one rod, and passed across the top down the other rod. An arc light was thus produced, and the two rods were consumed at the same rate by reason of the alternations. The heat developed was sufficient to burn away the clay at the arc.

Jaborandi, a plant occurring in Southern America, which is used in medicinal preparations, and is the source of three different alkaloids—*jaborine*, *pilocarpine*, and *pilocarpidine*, all of which exhibit marked physiological activity, and to which the medicinal properties of the plant extracts are due. The drug, and its active principle, *pilocarpine*, have been extensively used of late years in medicine, mainly with a view to acting upon the skin, producing sweating in disease of the heart and kidneys.

Jacamar, any bird of the South American family Galbulidæ, resembling in form the bee-eaters of the Old World. They are arboreal and insectivorous, with slender body, long slender bill, wedge-shaped tail, and the toes in pairs. In one genus, *Jacamaralcyon*, there is a single toe behind. The plumage is usually metallic green.

Jacana, any bird of the sub-family Parrinæ, of the Rail family. They are plover-like birds, from the warmer parts of both hemispheres, with very long toes and claws that enable them to walk with ease on floating vegetation. There is a horny wing

spur and generally a frontal lobe with wattles at the base of the bill.

Jacaré. [ALLIGATOR.]

Jachmann, EDUARD KARL EMANUEL, German seaman, was born at Danzig in 1822, and became a captain in 1859. In 1862 he commanded the *Thetis* in an expedition to Eastern Asia, and in 1864 commanded the Prussian squadron at the battle of Jasmund. For this he was promoted to be rear-admiral. From 1864 to 1867 he was port-admiral at Kiel, in 1868 he was made vice-admiral, in 1871 he became commander-in-chief of the German navy, and in 1873 he retired. He died in 1887.

Jack, the colours displayed from a staff erected on a ship's bowsprit, or on her bows; especially the Union Jack. [FLAG.]

Jack, HYDRAULIC, a small portable hydraulic press arranged with a force-pump working by hand, and used for the purpose of lifting heavy bodies. A *screw-jack* has the same object, but works on the principle of the screw. A strong screw with square threads is held in a vertical frame and turned by means of a hand lever. It thus rises, and may be made to lift up heavy weights under which it has been inserted. Its multiplying power is increased by lengthening the lever, and by diminishing the pitch of the screw, but usually its efficiency is much less than that of the hydraulic-jack by reason of the great loss of energy in overcoming friction.

Jackal, a name, adopted from the Persian, for several species of wild dogs, intermediate between wolves and foxes, from Southern Asia and Africa. They are nocturnal, and hunt in packs, giving voice in fearful howls. They are useful scavengers, clearing away carrion and garbage—a diet which



JACKAL (*Canis aureus*).

is the cause of their offensive odour; but they commit great depredations among poultry and other domestic animals. Sickly sheep and goats often fall victims to jackals, and a wounded antelope is pretty sure to be tracked down by a pack. Hares are their favourite quarry in Ceylon, but they have been known to hunt and pull down a deer. Their cunning is as proverbial in the East as that of the fox is in the West, and the "fox" of Scripture is probably in many cases the jackal. Dr. Jerdon says that the idea, that the jackal is the lion's provider may have arisen from the notion that the yell of the pack gives notice to the lion

that prey is afoot, or from jackals having been seen to feed on the remnants of the prey killed by the lion. The Common Jackal (*Canis aureus*), from Asia and the north of Africa, is dusky-yellow in colour, but subject to a great deal of variation. It is about three feet long (the tail counting for a foot), and the height at the shoulder eighteen inches. The Black-backed Jackal (*C. mesomelas*), ranging from Nubia to the Cape, and the Senegal Jackal (*C. anthus*), from Central Africa, are somewhat larger.

Jackdaw (*Corvus monedula*), an Old World species of the type-genus of the Crow family. It is a little more than a foot in length, with black plumage, glossed on the wings with purple, and dark grey neck. It is a native of Britain, and feeds on insects, worms, and molluscs. Jackdaws nest socially in holes in cliffs, in trees, ruins, church towers, and sometimes in chimneys. They have considerable power of mimicry, and are often kept as pets.

Jackson, the name of numerous towns and geographical districts in the United States, the chief of which are:—(1) A large county in the N.E. of Alabama, from the fertile soil of which cotton, wheat, Indian corn, and various kinds of grass are raised. (2) A city in Michigan, capital of a county of the same name. It is the terminus of several railways, and contains the State prison. (3) The capital of the State of Mississippi, 183 miles N. of New Orleans. It contains the State library and a State institution for the deaf and dumb. Large quantities of cotton are shipped from it every year. (4) The capital of Madison county, Tennessee, 90 miles E.N.E. of Memphis. It is the seat of a Baptist university, and exports cotton.

Jackson, ANDREW (1767–1845), seventh President of the United States. He was early left an orphan, and suffered much in his youth. He was taken prisoner in the War of Independence, after the conclusion of which he entered upon his twofold career of lawyer and soldier. He was a member of the convention which framed the Tennessee constitution, became a United States senator in 1797, and a judge of the Tennessee Supreme Court in the following year. He commanded the State militia in the war of 1812, and on December 23, 1814, when he had become a general in the United States army, repulsed with great loss the attack of Sir E. Pakenham on New Orleans. In the previous year he had successfully closed the war with the Creek Indians. In 1824 he was a candidate for the Presidency of the United States, and four years later was elected. In 1832 he was re-elected. He was largely influenced by personal friends who held no office and were named "the Kitchen Cabinet," and acted somewhat arbitrarily in vetoing the Bill for the renewal of the charter of the United States Bank in 1832, and in causing its deposits to be withdrawn and placed in the State banks. On the other hand, by his firm conduct towards the advocates of "nullification" (the doctrine that a State has the power to annul a Federal law) he postponed for several years the struggle between them which afterwards broke out on the slavery question.

Jackson, THOMAS JONATHAN (1824-63), was born in West Virginia. He entered the army in 1846, and distinguished himself in the Mexican War. In 1851 he became a professor in the Military Academy of Virginia, and soon after resigned his commission in the army. Ten years later, when his native State seceded, Jackson was appointed colonel in the Confederate army, and commanded a brigade under Johnston at the first battle of Bull Run. Here he acquired the *sobriquet* of "Stonewall Jackson" by the firmness of his troops under the Federal fire. He was immediately after given a command, and gained the victories of Winchester and Port Republic. He afterwards co-operated with Lee, and drove one Federal army northward. In 1862 he was made lieutenant-general. After rendering good service in the defence of Fredericksburg, he brought to a culminating point his military career by a brilliant manoeuvre and charge in the battle of Chancellorsville (1863). A few days later he died from the results of wounds received from his own army, some of whom had fired upon him by mistake at night.

Jacksonville, the name of several towns in the United States, of which the chief are:—(1) A town in the N.E. of Florida, situated at the mouth of St. John's River. It has a large export and coasting trade. It is also a great health-resort. (2) A town in Illinois, 30 miles W.S.W. of Springfield. Here are several State institutions (for the blind, the insane, etc.), a free library, and twenty-two churches; also Illinois College and a Conservatory of Music. (3) A town of North Carolina.

Jacobi, FRIEDRICH HEINRICH (1743-1819), a German philosopher and man of letters, was born at Düsseldorf. His youth was devoted to business, and his middle life to the service of the State. In 1805 he became president of the Munich Academy. A zealous adherent of Spinoza, and an acquaintance of Lessing and Goethe, he had controversies with Moses Mendelssohn and Schelling. His chief works were *On the Things of God and their Revelation*, *David Hume on Belief*, and *Waldemar*, a philosophic novel.

Jacobi, KARL GUSTAV (1804-51), an able mathematician of Jewish parentage, was a native of Potsdam. He graduated at Berlin, and held professorships at Königsberg from 1827 to 1842. He was author of *Fundamenta Nova Theoriæ Functionum Ellipticarum* (1829), and published many important contributions to mathematical science in *Crelle's Journal*. He was one of the founders of the theory of determinants. He died a royal pensioner at Berlin.

Jacobins, THE, took their name from the "Convent of the Jacobins," a Dominican monastery where they held their sittings. The Dominicans were called Jacobins, because their earliest house in Paris had been dedicated to St. James. The nucleus of the Jacobin Club was the "Club Bréton," a body of Breton deputies to the States-General who used to meet at Versailles to concert action in the Assembly. Out of this grew "the Friends of

the Constitution," a larger body, who, when they moved to Paris with the King and Assembly in October, 1789, met at the "Couvent des Jacobins." Their proceedings soon became public, their debates were reported, and citizens who were not deputies became members. The Moderate Revolutionists, such as Lafayette, now began to secede, and the society was directed by the members of the Left and Left-Centre in the Constituent Assembly. During the year 1790 more than one thousand similar clubs were formed throughout France, and were affiliated with the "mother-society," with whom also an elaborate system of correspondence was organised. After the death of Mirabeau (March, 1791) the influence of Robespierre began to be predominant, and the name Jacobin came to have a wider significance. After the flight from Varennes the society was reorganised on a more democratic basis, but the club as a body took no part in the Revolution of the tenth of August (1792). Robespierre and most of the leaders also opposed the conflict with Europe, which was the policy of the Gironde. The Jacobins defended Marat from the attacks of the latter party, and assisted the Commune to destroy them. They supported Robespierre in his proscription of the Dantonists and Hébertists, and they shared in his fall. More than one hundred perished with him on the scaffold, and the club, temporarily closed, was not allowed to be reopened until the society had undergone a thorough purgation. In November, 1794, the chief leaders of the Thermidorian reaction obtained a decree for the suspension of their sittings, and when this was resisted Legendre treated the Jacobins as Cromwell had the Rump. In 1799 a new society, which had been formed under the same name, was dissolved by order of the Directory.

Jacobites, the general name given to adherents of the Stewart dynasty after the Revolution of 1688. Etymologically the word means "followers of James" (Jacobus). Their history may be divided into three periods, viz.:—(1) From the Revolution to the death of James II.; (2) from the accession of Anne to 1715; (3) from 1715 to 1745. During the reign of William III., until the Peace of Ryswick, they had the support of France. Their attack on Ireland was, however, foiled at Derry and the Boyne, and a French invasion of England was averted by the victory of La Hogue. After this they were never very strong in England. There were several plots to assassinate William III., and leading men of all parties corresponded with the Court of St. Germain's to secure their position in case of a counter-revolution; but the bigotry of James kept dissensions alive, and prevented those who had supported the Revolution in the interests of Protestantism from giving more than a theoretical adherence to the Jacobite cause. James Edward's recognition by France on the death of his father in 1701 aroused the national jealousy felt by England for that country. In Scotland, however, Jacobitism obtained support from clan-feeling, and the unpopularity of the war with France which grew up after its early years, combined with the good-will

of Anne towards her family, made it extremely probable that on her death the Stewarts would be restored. She died, however, before the plans of the Tories were fully matured. The nation as a whole were neutral; but the mercantile classes were interested in the preservation of the Act of Settlement, and the securities given for the safety of the Protestant religion were not deemed adequate. The Whigs, moreover, through the appointment of Shrewsbury as Treasurer, secured the army and the ports. The Regent Orleans had different views from Louis XIV., and in the Fifteen the Jacobites had no French support. The revolt of the Highlanders was led by the unstable Mar, who was soon separated from his English allies, and re-embarked with the old Pretender. The English Jacobites surrendered at Preston, and their leaders were executed. Wyndham and five other Tory-Jacobites, who had seats in Parliament, had been previously secured in the Tower. The Jacobites were now distinctly divided into a parliamentary opposition which allied itself with the malcontent Whigs, and a mere band of intriguers. Bolingbroke, who had been James Edward's Secretary of State at St. Germain for a short time after the Fifteen, came back from France in 1723, and was the soul of the constitutional section. Walpole's policy towards them was a mixture of conciliation and firmness. On his fall and the end of the long alliance with France under Fleury, the warlike party were again in the ascendant. A French invasion of Scotland was prevented by a storm in 1744, but on July 25 of the next year Charles Edward, the young Pretender, landed at Moidart. He was supported by the clans and helped by the incompetence of Sir John Cope, the English general, whom he defeated at Prestonpans. He then out-manceuvred Wade and marched into England, where, however, he obtained little support. The Highlanders were divided by clan jealousies, and after reaching Derby the invading army marched back to Scotland. Another success was gained at Falkirk, but was soon followed by the disaster of Culloden, after which Jacobitism and the independence of the Highland chiefs, which had been its chief support since 1715, came to an end simultaneously. On the accession of George III. a new Royalist party was formed, in which Jacobitism became merged. As a romantic sentiment it still remained till the days of Scott's childhood. [NON-JURORS, PRETENDER, ETC.]

Jacob's Ladder, or GREEK VALERIAN, *Polemonium caeruleum*, giving its name to the order Polemoniaceæ, is a herbaceous perennial, native to the North of England, and commonly grown in gardens, sometimes with variegated leaves. It grows about a foot high, with hardly branched stems, scattered pinnate leaves, and numerous shortly-stalked blue or white pentamerous flowers, nearly an inch across.

Jacotot, JOSEPH (1770-1840), French educationalist, was born at Dijon, at whose university he was professor of Latin at nineteen. He was a zealous Revolutionist, and served in Belgium in 1792. He afterwards returned to his native town, where he became professor of "method of

sciences," mathematics, and Roman law successively. In 1815 he was elected to the French Assembly, but afterwards went to live at Brussels, and was given an appointment in Louvain University. He returned to France after the Second Revolution. His system, which was adopted in Belgium, is set forth chiefly in his *Enseignement Universel, Langue Maternelle* (1823).

Jactitation of Marriage, the boasting or giving out by a party that he or she is married to some other, whereby a common reputation of their matrimony may follow. The person may be compelled to prove the actual marriage.

Jade, or NEPHRITE, two names signifying "kidney-stone," applied to a very tough variety of hornblende (q.v.) from its supposed value in renal disease. This silicate of lime and magnesia is crypto-crystalline or compact, and has a hardness of 6.5; but its toughness is its most noticeable character. It varies in colour from white (allied to tremolite), with a specific gravity of 2.9, to dark green (allied to actinolite), with a specific gravity of 3.0. It occurs in boulders near Batongol, to the west of Lake Baikal, and very rarely in Europe; but in the Kuen-lun Mountains it forms veins in schists and gneisses. It also occurs in New Zealand, New Caledonia, and other Pacific islands, where it has long been used by the natives for axes, clubs, and ornaments. Jadeite (q.v.), chloromelanite, saussurite, fibrolite, amazon-stone, and bowenite have been confused with jade, but most of these substances are heavier than true jade.

Jadeite, a silicate of aluminium and sodium, related to epidote, but resembling jade, from which it differs in greater hardness and weight, its specific gravity being 3.28 to 3.35. It occurs in Yunnan and Burmah, and implements, etc., made of it are found in Egypt, Switzerland, Mexico, and Costa Rica.

Jadejas (JAREJAS), a people of North-West India, forming with the Kattis the bulk of the population in the Kattiawar Peninsula and Katch. They are generally tall and shapely, and evidently of mixed type, showing traces both of Aryan and Semitic blood. Characteristic is the black silky beard, which acquires an enormous development, perhaps greater than in any other people. At present they regard themselves as Rajputs, though the claim is rejected by the very lowest castes of that haughty race. Morally they take a low position even in India, being great boasters, very contentious, given to drink, and of more than doubtful morals. Till recently female infanticide was practised, as amongst the Rajputs.

Jaen, the capital of a province of the same name in the north-east of Andalusia, Spain, is 37 miles north of Granada. A 16th-century cathedral stands on the site of an old mosque, and contains a relic called the Holy Face. There are also many churches and religious houses. In 1712 there was a terrible earthquake at Jaen.

Jaffa, or JOPPA (properly Yáfá), a port of Palestine about 30 miles N.W. of Jerusalem, with

which it is now connected by railway. It is mentioned in an inscription of Sennacherib, and was the harbour of Judæa after the exile. It was fortified by Simon Maccabæus, and destroyed by Vespasian as a nest of pirates. Captured by Saladin in 1187, it was retaken by Richard in 1191, but a few years later again taken by Malek el Adil. In 1799 it was stormed by Napoleon. The modern town is the seat of a lieutenant-governor, and has several foreign consulates. A trade in fruit and wheat is carried on. There are many fruit-gardens, orchards, and wells of sweet water in the neighbourhood. A railway runs up to Jerusalem.

Jagatai. [CHAGATAI.]

Jagellons, an illustrious dynasty which reigned in Lithuania, Poland, Bohemia, and Hungary, descended from Jagello, who succeeded to the grand-duchy of Lithuania in 1381, and, on the death of his father-in-law Lewis the Great, became king of Poland after being converted to Christianity under the name Ladislaus II. Six of his family reigned in succession, the last, Sigismund Augustus, dying in 1572, but his line was continued through a sister of the last king until 1668. The younger branch reigned in Hungary and Bohemia till Lewis II. was killed (1526) by the Turks.

Jaggas (CHAGAS), a Bantu people of the south-east slopes of Mount Kilimanjaro, East Africa. Their territory lies on the main route between the coast and the equatorial lake regions. They are of a mild disposition, industrious agriculturists, and friendly to Europeans, to whom they now look for protection against the incursions of the predatory Masai tribes. In the recent partition of East Africa between England and Germany the Jagga county was assigned to the latter power, the dividing line running a little north of Kilimanjaro.

Jaguar (*Felis onca*), the American "tiger," ranging over the Western continent from Texas to parts of Patagonia, frequenting the wooded banks of the great rivers and the reedy shores of lakes. It is rather larger than the leopard (q.v.), and the tawny fur is marked pretty regularly with ring-like spots enclosing a disc darker than the ground colour, and often marked with small dark dots. Jaguars seem to have little fear of man, and though they will seldom attack him when they can get other food, Wallace records a case where one entered the hut of an Indian and sprang upon him in his hammock. Horses and mules are their favourite food, but they also eat fish and turtles, scooping out the flesh of the latter from the unbroken shell with their paws. The story of their contests with alligators, though generally discredited, is recorded by Wallace on what he seems to consider good evidence. But a great deal would depend on the size of the alligator.

Jahn, Otto (1813-69), a German philologist and archæologist, was born at Kiel, and educated there and at Leipzig and Berlin. He left Kiel for Greifswald, to which he went as professor of archæology in 1842, held a chair at Leipzig from 1847 to 1851, and from 1855 till his death was professor at Bonn. Besides important archæological and philological

writings, he was author of a life of Mozart and editor of some of Goethe's letters.

Jail fever. A term which is now happily out of date. In bygone days, when little or no attention was directed to the sanitary conditions of prisons, and when gross overcrowding was allowed to exist in them, it was no uncommon thing for large numbers of prisoners to die of a malady to which this name was given. The disease was probably, in most instances, typhus fever.

Jains (JAINAS), the great trading class of West India, whose guilds date back to Buddhist times before the Mohammedan invasions. But they have long ceased to be true Buddhists, though preserving many traditions and even ceremonies of that religion. The later Jains suffered much persecution from the Brahmins for introducing foreign goods and artisans into the country. They admit caste, which is rejected by all Buddhists, but still use Pali as their sacred language. The Jains are very enterprising, and form numerous wealthy communities, especially in Rajputana and throughout the Bombay presidency.

Jaisalmir, or JESSULMEER, a native state under British protection, forming the north-western corner of Rajputana, Hindostan, has an area of 16,447 square miles. It forms part of the Great Desert, and there is only one small river. Sandhills cover the face of the country far and wide. Camels and sheep are kept by the inhabitants.

Jakuns, collective name of numerous aboriginal tribes of the Malay peninsula, who present a great variety of types, showing all the transitions between the indigenous Negritos and the intruding Malays. Including the Sakai, Besisk, and others, there are three distinct groups, those of Johore in the extreme south, of Malacca on the west coast, and of Rumbau and Saney-Ujong further inland. Some are scarcely to be distinguished from the true Negritos, being noted for their small stature (4 ft. 10 in.), deep brown complexion, frizzly hair and pronounced prognathism. They mostly speak rude Malay dialects, wear no clothing, dwell in frail huts of branches and foliage, and live exclusively by the chase. (Boriè, *On the Wild Tribes of the Interior of the Malay Peninsula*; E. T. Henry, *Sur les Races Sauvages de la Péninsule Malaise, et en particulier sur les Jakuns*, in *Bull. de la Soc. d'Anthrop.* IX. p. 717.)

Jalap, a purgative drug consisting of the large root-tubercles of *Exogonium purga*, a convolvulaceous plant, native to woods on the eastern slopes of the Mexican Andes, near Jalapa, whence it derives its name. It has twining aerial stems, cordate-acuminate leaves, and salver-shaped purplish-pink flowers. From its slender rhizomes proceed the turnip-shaped tubercles, sometimes as large as an orange, which are brown externally with small transverse scars, and whitish internally. Jalap owes its properties to one or more resinous substances present to the extent of from 12 to 18 per cent., and worm-eaten tubercles are more valuable from the removal by the insects of the starchy and

woody parts. Besides Mexican or Vera-Cruz jalap, as it is called from the port of shipment, the drug is now cultivated in Jamaica and Ootacamund; and *Ipomæa simulans* and *I. orizabensis*, species of a closely-allied genus, yield Tampico, and Orizaba, woody, or male, jalap. It is largely used for its purgative properties. It is administered in the form of the resin, extract, tincture, and compound jalap powder. The dose of the last-named preparation is from 20 to 60 grains for an adult.

Jalapa (XALAPA), a town in Mexico, some 70 miles north of Vera Cruz, is situated 4,500 feet above the sea in very fertile country. It has a 16th-century Franciscan monastery, and was formerly of some commercial importance. The drug jalap grows wild here.

Jalisco (XALISCO), or GUADALAJARA, a fertile but unhealthy state on the Pacific coast of Mexico, having an area of nearly 40,000 square miles. Through it runs the river Santiago, and on the southern border is Lake Chapala. The capital is Guadalajara.

Jamaica (Xaymaca, "Land of springs"), the chief of the British West Indian islands, is about 100 miles to the south of Cuba and about the same distance west of Hayti. It is about 144 miles long from west to east, and 50 broad. The Cayman Islands, as well as Caicos Island and Turk's Island, are included in the governmental area. Discovered by Columbus in 1494, it was in a few years occupied by the Spaniards. By a treaty made in 1670 it was ceded to England, having been held by her since 1655, when Penn and Venables conquered it. The aboriginal Indians were then nearly extinct. Cromwell shipped thither many prisoners, especially those taken in Ireland. African negroes had been imported by the Spaniards to work the plantations, and the English imported many more till the emancipation of the slaves in 1834. Insurrections of the slaves, who were very badly treated, broke out in 1760, 1765, and 1795, although three years before the last movement an Act had been passed for ameliorating their condition. The British Legislature did its best, but the planters were not to be controlled, and in 1831 another movement had to be put down. In 1838, after a parliamentary inquiry, an Act abolishing apprenticeship was passed by the Imperial Parliament. In 1865 the last insurrection of the slaves was crushed with great severity by Governor Eyre (q.v.). The constitution granted in 1664 was then annulled, and Jamaica has since been a Crown colony, under a Governor, a Legislative Council, and a Privy Council. The Blue Mountains, which vary in height from 5,000 to 7,500 feet, traverse the eastern part of the island. Jamaica has a fine stretch of coast-line, and more than thirty fine harbours, of which the finest is Kingston Harbour, or Port Royal. There is great variety of climate; the coast is less healthy than the interior. Partial rains fall in the spring; the heavy rains begin in June and last two months, during which intense heat prevails. A third rainy season is in October and November. Many kinds of water-fowl are found, as well as parrots and

pigeons, and a wide variety of insects, but few snakes. Land-crabs and tortoises abound, more especially the violet crab (*Cancer ruricola*). The chief fruits are the mango, the banana, the pineapple, cocoanut, melon, mulberry, and bread-fruit. Maize flourishes greatly, and guinea-grass, which is very useful for grazing purposes, grows to a height of nearly 6 feet. Large crops are also raised of ginger, cochineal, pepper, vanilla, arrow-root, and several medicinal herbs. The chief articles grown for export are sugar, various fruits, coffee, pimento, logwood, and ginger, more than half the trade being with the United States. Many negroes have small holdings, and are the chief fruit-growers. Rising industries are horse-breeding and the curing of fish, which abound in the rivers. It is thought by experts that the chief wealth of Jamaica lies in its minerals; and gold, silver, and the chief other metals are known to exist in considerable quantities, but are little drawn upon. What were known as "Jamaica diamonds" turned out to be crystals. Jamaica is divided into three divisions or counties, of which the largest is Middlesex, the central portion; the others are Surrey, on the east, and Cornwall, on the west. The capital is Kingston (q.v.), and the chief other town is Spanish Town (St. Jago de la Vega), a little further west.

James, ST., son of Zebedee and brother of St. John, was put to death under Herod Agrippa, in the year 44. His festival is on July 25. He is the patron-saint of Spain.

James, ST., son of Alphæus, another of the Twelve Apostles. His festival, together with that of St. Philip, is kept by Roman and Anglo-Catholics on May 1.

James, ST., called "the Great" or "the Just," also "the Lord's brother," was the probable author of the Epistle of St. James. He seems to have held the position of Bishop of Jerusalem (see several passages in the Acts). Josephus says he was stoned to death by order of Amanus, the high-priest, in the year 62; but Eusebius took from Hegesippus another tradition as to his death. By the Greek Church his festival is kept on October 23. The separate identity of James the son of Alphæus and James the Lord's brother is not clearly established, and the authorship of the Epistle has sometimes been ascribed to James the brother of John.

James I., king of England (James VI. of Scotland), was born in 1566, the son of Darnley and Mary Queen of Scots. He was carefully educated by George Buchanan and other tutors, but his youth was passed in troublous times. From the year 1578, when the Regency was taken from Morton, he was nominally king of Scotland. His mother was still alive, but was a prisoner in England. In 1585 he consented to receive a pension from Elizabeth, and though he made a formal protest against the execution of Mary, his resentment did not prevent his co-operating with England against Spain. The chief events of James's reign in Scotland were the abolition of Episcopacy in 1581, and the subsequent seizure of the king, who

had opposed it, by the conspirators who carried out what was called the Raid of Ruthven; the rescue of the king next year by Gowrie, Mar, and Glencairn; the revolt of the king against his rescuers, and his defeat of them in 1584; the compulsory pardon of the remnant of these at Stirling (1585) and dismissal of the obnoxious Arran; the rebellions of Bothwell (nephew of Mary Stuart's husband) in 1592, 1593, and 1594; the final defeat of Huntly and Errol, the Catholic malcontents, at Glenlivet in the latter year; and the Gowrie Conspiracy (q.v.). James had been for some time in secret correspondence with Robert Cecil, who prepared the way for his general acceptance as King of England on the death of Elizabeth in 1603. Here he was able to carry out his Arminian views with more freedom than had been possible in Scotland. But while the Puritans were dealt with firmly at the Hampton Court Conference, the Romanists were also offended by the expulsion of the Jesuits, and the result was the Gunpowder Plot. Disputes with Parliament on the subject of money grants were frequent; and after the death of Cecil, Earl of Salisbury, power fell into the hands of favourites, first of Carr (Earl of Somerset) and then of George Villiers, Duke of Buckingham (q.v.). Under the latter illegal or vexatious ways of obtaining money were resorted to, and no Parliament sat between 1614 and 1621. That of 1621 impeached Bacon and refused to support James's foreign policy, and was therefore dissolved after a very short session. The king had married his daughter Elizabeth to the Elector Palatine, but refused to give the Protestant kinglet anything but moral support, till in 1624 the chagrin of Buckingham at the failure of the Spanish match led at last to a declaration of war against Spain. Parliament was reassembled for this purpose, and a French match for Prince Charles was being negotiated when the king died on March 27, 1625. James I. was a very diligent writer. The *Basilicon Doron*, and treatises against witches and tobacco, were his best-known productions.

James II. (1633-1701) was the second son of Charles I. by Henrietta Maria of France. After being captured at Oxford during the Civil War, he escaped to France, and served in the French and Spanish armies. He was created Lord High Admiral at the Restoration, and showed some ability as a naval commander in the Dutch wars. As an avowed Romanist, he was, however, compelled to resign his office on the passing of the Test Act (1673). An attempt was also made to exclude him by Act of Parliament from the throne; but though this failed, he was sent into honourable exile, first on the Continent and then to Scotland, where he acted as Lord High Commissioner. In 1684 he was illegally restored to the office of Lord High Admiral and to his seat in the Council. On the death of Charles II. in 1685 he succeeded peaceably to the throne, when he soon openly proselytised, dismissed his Parliament, called Romanists to his councils, and revived the Court of High Commission in order to punish the clergy for preaching against his attacks on Protestantism. He also

forced Romanists on some of the colleges at Oxford and Cambridge, obtained a decision from the judges in favour of the right of the Crown to dispense with laws, employed Romanist officers in an army he had assembled on Hounslow Heath, and finally in April, 1687, published the Declaration of Indulgence. The Nonconformists, however, refused to take the bait, and the seven bishops were supported by all sections of the nation when they refused to read it in the churches. They were then tried for libel, but triumphantly acquitted. William of Orange, who had long been in correspondence with the Whig leaders, was now invited by the leading men of all parties to protect English liberties against his father-in-law; and James Edward, the old Pretender, who was born at this time, was regarded as a supposititious child. William landed on Nov. 5, 1688; and James, when too late, rescinded his most arbitrary measures. Deserted by his army, he attempted to escape abroad, and was arrested at Faversham; but it was found convenient to allow him afterwards to effect his purpose. He was welcomed in France by Louis XIV., and with his help made an expedition to Ireland in the following year, but was defeated at the Boyne (1690). The remainder of his life was passed at St. Germain, under the protection of the French king, whose pensioner he had been even when actually ruler of England. James II. was twice married. Mary and Anne were his daughters by Anne Hyde, daughter of Lord Clarendon; the Old Pretender was the son of Mary of Modena. By his mistress Arabella Churchill, sister of Marlborough, he was father of the accomplished James, Duke of Berwick.

James I., king of Scotland (1391-1437), was the second son of Robert III., on whose death in 1406 he became king. He was, however, a prisoner in England from 1405 till 1424. The kingdom was governed till 1419 by his uncle Robert, first Duke of Albany, to whose machinations the capture of James was probably due; and afterwards, till the return of the king, by Albany's son, the second duke. The latter was put to death for misuse of his power by James, who reconstituted the Scots Parliament, reformed the statute law, and took measures to curb the Highlands and generally to maintain the authority of the law. The result was a conspiracy, headed by Sir James Graham, and the king was murdered in the Black Friars Abbey at Perth. James was both an able ruler and a cultivated man. His poems, *The King's Quhair* and *Christie's Kirk on the Green*, were the best produced in Great Britain in the 15th century.

James II. (1430-1460), son of James I., did not begin to rule for some years, the kingdom being in a state of feudal anarchy. In 1452 he stabbed William, Earl of Douglas, and two years later declared the estates of his house forfeited. In 1460 he crossed the border to help Henry VI. against the Yorkists, but soon returned, and was killed at the siege of Roxburgh Castle by the bursting of a cannon.

James III. (1453-1488), son of James II., was in the guardianship of the Bishop of St. Andrew's

till in 1466 he was carried off by the Boyds. When the king obtained some amount of power, he wished to lead an army to the help of Louis XI. of France, but was prevented by the Estates. He afterwards plunged into such excesses that a conspiracy of the nobles broke out on the eve of an expedition into England, and some of James's favourites were hanged at Lauder. The rest of the reign was occupied in schemes of vengeance against his enemies. The Estates took part against the king, who was defeated at Sauchieburn, near Stirling, and stabbed at Beaton's Mill, in the neighbourhood of Bannockburn, whither he had fled.

James IV. (1472-1513) came to the throne on the death of his father, James III. His relations with England were very hostile during his early years. In 1502, however, a temporary alliance was formed between the two countries by the marriage of James IV. to Margaret Tudor. The depredations of English pirates and the traditional influence of France, however, brought about the old state of things in a few years, and the result was the expedition which ended in the disaster of Flodden Field (q.v.), where the king of Scotland fell.

James V. (1512-1542) was but a year old when he became titular king of Scotland after Flodden. French influence was at first in the ascendant, and Albany, the regent, was able to fill the towns of Scotland with French garrisons. The queen-mother and her second husband, Angus, headed the English party, and in 1524 Albany was deprived of the regency. Quarrels between Angus, Argyle, and other great nobles followed, and in 1528 James escaped from their control and drove his step-father into England. Peace with England was made in 1534; but James made two French marriages—the first with Magdalen, daughter of Louis XII., the second with Mary of Guise, who became the mother of Mary Stuart, Queen of Scots. James V. was known as "the King of the Commons," whom he conciliated by his lavish generosity, and still more by his firmness towards the nobles. This, and the confiscation of estates seized by the latter during the minority, alienated them to such an extent that when the last of the Scottish kings led an expedition against England they deserted him. Solway Moss was less a battle than a rout, and the king died of chagrin shortly afterwards.

James, GEORGE PAYNE RAINSFORD (1801-60), a historical novelist, was the son of a London physician. After much travelling and discursive reading, he published *Richelieu* in 1829, and for nearly twenty years continued to produce similar works, the sum-total of which is said to have reached a hundred. *Darnley*, *Philip Augustus*, and *Henry Masterton* were some of the best. They were very popular and profitable to the author. James was made historiographer by William IV., and published *A Life of the Black Prince* and other historical works. He was British consul in Massachusetts and Virginia for several years, and subsequently at Venice, where he died.

James, SIR HENRY (1803-77), military surveyor, was a native of St. Agnes, Cornwall. In 1820 he

was gazetted a subaltern in the Royal Engineers, and was next year appointed to the Ordnance Survey. In 1842 he became local superintendent of the geological survey of Ireland, and, after being employed in various other duties, was in 1854 made director-general of the Ordnance Survey. From 1857 to 1870 he was director of the Topographical Department of the War Office, was knighted in 1860, and attained the rank of major-general in 1868.

James of HEREFORD, LORD (Sir Henry James), was born in 1828 at Hereford. He was called to the Bar in 1852, took silk in 1869, and entered Parliament as a Liberal in the same year. In 1873 he was named Solicitor-General, and was afterwards Attorney-General until the resignation of Mr. Gladstone. From 1880 till 1885 he again held the latter office, and was chiefly responsible for the passing of the Corrupt Practices Act (1883). He was offered the Lord Chancellorship in Mr. Gladstone's first Home-Rule Ministry, but declined. From 1895 to 1902 he was Chancellor of the Duchy of Lancaster, receiving a Baronetcy in the former year.

James, HENRY, novelist, was born in New York in 1843, but has lived chiefly in England and Italy. He was educated at Harvard, Geneva, and Paris. His first novel, *Roderick Hudson*, appeared in 1875, and was followed by others in 1878, 1881, and 1886, and later: *The Ankward Age* (1899), *The Sacred Fount* (1901), *The Wings of a Dove* (1902), *English Hours* and *The Golden Bowl* (1905), *The American Scene* (1907), etc. He has also published *French Poets and Novelists* (1878), *Hawthorne and Partial Portraits* (1888).

James, JOHN ANGELL (1785-1859), a popular Independent minister, was born in Dorsetshire. He made a reputation as a preacher at Birmingham, where he officiated at Carr's Lane Chapel. He took an active part in municipal affairs, was chairman of Spring Hill College, and one of the founders of the Evangelical Alliance. He was also the author of numerous devotional works, after reading one of which, *Christian Charity*, Wordsworth sought his acquaintance.

James, WILLIAM, naval historian, who died in 1827, published in 1817 *Naval Occurrences with the Americans*, and in 1822 *The Naval History of Great Britain from the Declaration of War by France to the Accession of George IV.* (1793-1820). The work is the best authority for the period which it covers.

Jameson, ANNA BROWNELL (1794-1860), a prolific writer on art and various other subjects, was the daughter of a Dublin miniature painter named Murphy. After having been for several years a governess, she was married in 1825; but she was not happy with her husband, who left her in England when, four years later, he went to Dominica to take up a legal appointment. Mrs. Jameson's first work was published in 1826, but her *Characteristics of Women* (1832), a series of essays on Shakespeare's female characters, was her first book of any great merit. During a visit to the Continent in the following year she became intimate with

Ottile von Goethe, and met Tieck and Schlegel. Her best-known works are *Poetry of Sacred and Legendary Art* and *History of our Lord and of John the Baptist, as represented in Art*, which was finished by Lady Eastlake.

Jameson Raid, an advance made by Dr. Jameson, one of the officers of the British South Africa Company, on Dec. 29, 1895, into the territory of the Transvaal. Dr. Jameson was completely defeated by the Boers at Krugersdorp, and surrendered with all his force. The proceedings were repudiated by the High Commissioner of South Africa, and Dr. Jameson was afterwards tried and sentenced to fifteen months' imprisonment.

Jamesone, GEORGE (d. 1644), a Scotch portrait painter, a native of Aberdeen, was born about 1588. He is said to have studied under Rubens at Antwerp. He returned to Scotland about 1620, and painted portraits of James VI., Charles I., Montrose, and others of his chief contemporaries.

James River, a river of Virginia, U.S.A., 450 miles in length, is formed by the junction of two streams near the eastern border of West Virginia, and flows in an easterly direction, bending at first to the south, then making a northerly curve, and finally turning south till it reaches the Atlantic by a large estuary about twenty miles below Richmond. It is navigable by large steamers for about sixty miles.

James's powder. The pulvis antimonialis of the pharmacopœia is the modern substitute for this preparation, which was formerly largely used in fevers. The remedy is a depressing one, and its indiscriminate employment cannot be recommended.

Jamesonite, a mineral consisting of the sulphides of lead and antimony ($Pb_2Sb_2S_5$), which occurs as crystals of the rhombic system in Cornwall, Hungary, Siberia, and Brazil. It frequently contains small quantities of iron, has a specific gravity of 5.7, and varies in colour from steel grey to almost black.

Jamieson, JOHN (1759-1838), author of *Etymological Dictionary of the Scottish Language*, was born at Glasgow, at whose university he entered at the age of nine. He was sixteen years a minister at Forfar, but was invited to Edinburgh in 1797, two years before he had replied to Priestley's *History of Early Opinion*. While here he contributed to the union of the burgher and anti-burgher sects in 1820.

Jamshidi, a large tribe in the province of Herat, Afghanistan, numerous especially in the district watered by the Khûshk and its affluents. Though often grouped with the Zeidnat Hazaras, as of Mongol descent, the Jamshidis appear to be of Persian stock, as shown by their almost pure Iranian type of physiognomy. All are Mohammedans of Persian speech, and live a much more settled life than the Hazaras.

Janin, JULES GABRIEL (1804-74), a French critic and novelist, was the son of poor parents,

living at St. Étienne. He made his reputation as dramatic critic of the *Journal des Débats*, his contributions to which were collected under the title, *Histoire de la Littérature Dramatique*. He also wrote numerous novels, translated Horace and *Clarissa Harlow*, and edited, with Sainte Beuve and Houssaye, fragments from *Manon Lescaut*. Twelve volumes of his *Œuvres Choiesies* appeared in 1875-78. Janin succeeded to the chair of Sainte Beuve in the Académie in 1870.

Janina [JOANNINA], the largest town in a district of the same name forming the central portion of Albania, stands picturesquely on the western shore of a lake about fifty miles north-east of Corfu. At the beginning of the 19th century it was a large town, the residence of Ali Pasha; but the fortress is now in ruins. The town has been Turkish for nearly five centuries, but the bulk of the population are Greeks. The place has long been famous for its manufacture of gold lace.

Janissaries, **Janizaries**, the Anglicised form (through Italian or French) of the Turkish *Yenicheri* (from *yeni* = "new" and *ashar* = "army") or infantry of the Sultan's guard, organised and named towards the end of the fourteenth century, under Amurath I. They were originally the Sultan's fifth of the Christian captives taken from the Albanians, Servians, Bosnians, Roumanians, Bulgarians, and other nations, the finest youths only being enrolled. They were converted to the Mohammedan religion, and subjected to the strictest discipline. The force was increased and supplemented by fresh contingents of captives, and by recruits from the children of Christians living under Mohammedan rule, who were compulsorily enlisted every five years, and carefully educated as Mohammedans. Their careful selection, their excellent education, and their rigid monastic discipline made them invincible soldiers, and on their exploits at Varna, Cassova, and numerous other battles, was based the power of the Ottoman arms. After the death of Soliman II. this formidable force frequently coerced or even deposed the Sultan. After their resistance to repeated efforts to reform their organisation, and render it less dangerous to the State, had brought about several revolutions, they rebelled in 1826; but were completely defeated, and finally abolished under Mamhoud II.

Jansen, CORNELIUS (1585-1638), a celebrated Dutch theologian, was born near Gorcum in Holland of humble parentage. He studied at the University of Louvain, first at the Jesuit's college, and afterwards at the college of Adrian IV., where he fell under the influence of Jacobus Jansonius, from whom he imbibed the Augustinian doctrine of grace. In 1604 he went to Paris, and afterwards spent several years with Vergerius at Bayonne. In 1617 he was summoned to Louvain to take the headship of the new college of St. Pulcheria. In 1619 he took the degree of doctor in theology, and in 1630 became professor of Biblical exegesis. All this time he was actively using his influence against

the Jesuits, and as the result of two visits he made to Spain in 1624 and 1626, certain encroachments made by them on the privileges of Louvain University were restrained. In 1636 he was made bishop of Ypres, as a reward for a work published by him under a pseudonym against the alliance of France with the Protestant Gustavus Adolphus.

For the last twenty-two years of his life he was at work upon his great treatise "*Augustinus, seu doctrina S. Augustini de humane naturae Sanitate, aegritudine, et medicina, adversus Pelagianos et Massilienses*," which was published, posthumously, in 1640 in three folio volumes. The importance of the work lay in the epilogue, in which the doctrines of the Jesuits were compared to the errors of the Massilians.

In France the matter later became an important political question. After a struggle, the bull called "*Unigenitus*" (1713) was registered as a law by the Parliament of Paris. After this the Jansenists in France declined into a set of mystical fanatics. [PARIS, FRANÇOIS DE.]

Janssen, VAN CEULEN (sometimes called JONSON or JOHNSON), a Dutch portrait painter who lived some time in England, was born probably in London in 1593, but may have been a native of Amsterdam. He painted portraits in this country till the Civil War, when he went to Holland, and died about 1664.

Janssens, ABRAHAM (1567-1632), historical painter, was born at Antwerp, where in 1607 he was dean of the master painters. Good examples of his art, which resemble that of Rubens, are to be seen in the Antwerp Museums and at Vienna. He called himself Janssens van Nuysen.

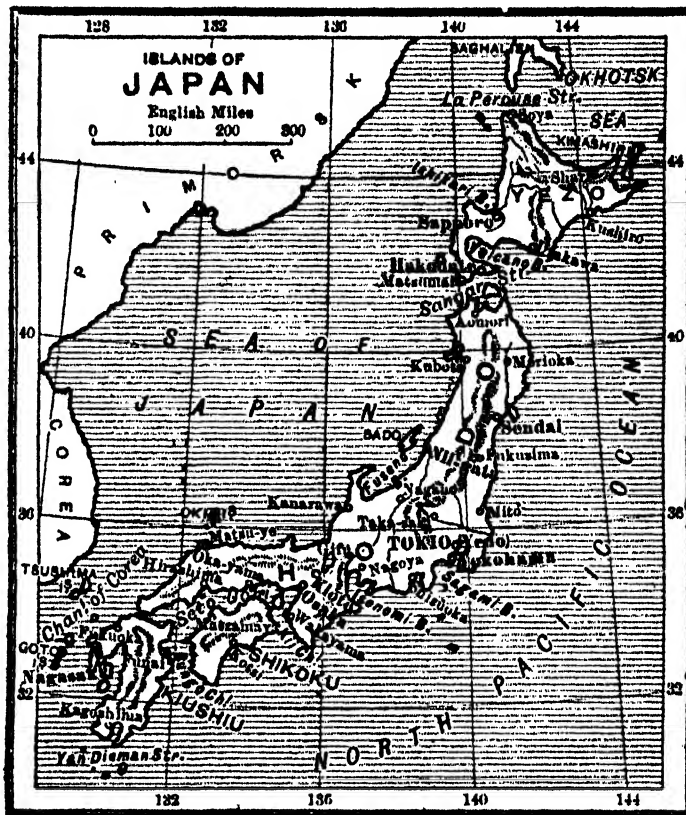
Janssens, VICTOR HONORIUS (1664-1739), another historical painter, was born at Brussels. In 1718 he was made painter to the emperor at Vienna. The churches and palaces of the Netherlands contain many examples of his art.

Januarius, ST. (SAN GENARO), the patron saint of Naples, was Bishop of Benevento at the end of the 3rd century. According to the Roman Breviary he suffered martyrdom under Diocletian at Pozzuoli in 305. His body was then taken to Naples, where some of his blood was preserved in a phial. It is supposed to liquefy on his anniversary (September 19), and two other days in the year, when it is carried in procession to be adored by the people. On the occurrence of any public calamity resort is also had to the miracle, which is even thought to counteract the eruptions of Vesuvius.

Janus, an Italian divinity, the god of opening and beginning (Lat. *Janua* = gate). He took precedence even of Jupiter, and is supposed by some authorities to have been of Etruscan origin. The hill called Janiculum, on the N. of the Tiber, was probably the original seat of his worship. He is represented on coins with two faces looking in opposite directions. He carries keys and is crowned with laurel. The gates of his temple at Rome were open in time of war, and shut in time of peace. There was originally an archway on the site, from which the troops marched out to war.

January, or the first month of the agricultural year, took its name from the God Janus.

Japan is one of the most interesting countries in the world, consisting of a long chain of islands separated from the eastern coast of Asia by the seas of Japan and Okhotsk, and extending from 24° to 50° 40' N. lat., and 124° to 156° 38' E. long. It descends from the Kurile Islands south-west to the Loochoo group. Southern Saghalien was first ceded



MAP OF JAPAN.

to Russia for the Kuriles, but regained by Japan as one of the results of the war (1904-5). The empire is called by the natives Dai Nippon ("Great Japan"), or Nippon, which means "sun's origin," i.e., the land over which the sun first rises. The principal islands are:—Hondo or Honshu, i.e. the Main Island, Kiushiu, Shikoku, Yezo, Sado, Tsushima, Hirado, Awaji, Oshima, Iki, the Oki group, the Goto group, the Bonin group, the Riukiu group (Loochoo), the Kurile group. The islands, over 4,000 in number, embrace 147,697 square miles.

Political Divisions and Population. Japan is divided into provinces, but for purposes of administration the whole empire except the Hokkaido has been again divided into three cities (*Fu*) and forty-three prefectures (*Ken*). The three cities are Yedo, Ozaka, and Kioto. In 1869 Yedo received the name of Tokio or *Eastern Capital*, as opposed to Saikio, *Western Capital*, the new name for Kioto, in consequence of the removal of the Emperor's court from his old capital to Yedo. But while the Japanese invariably speak of Tokio, they still adhere to Kioto, not Saikio. The limits of the Ken are irrespective of the boundaries of provinces; many Kens contain several provinces or portions of different

provinces. In 1878-9 the Okinawa Ken was created, including the Riukiu (Loochoo) group, till then governed by a chief of its own, though it had for many years sent tribute to both China and Japan. The question of double allegiance was solved by Japan asserting its sovereignty, the king receiving the title of Noble of Japan. Whether this may not embroil it with China is not yet definitely settled. The population in 1907 was 48,864,010, about 300 to the square mile, a remarkable fact considering that only one-sixth of the empire is cultivatable. The principal cities are Tokio, population (1903), 1,818,655; Osaka, 995,945; Kioto, 380,568; Nagoya, 288,639; Kobe, 285,002; Yokohama, 326,035; Nagasaki, 153,293; Hakodate, 85,313; Niigata, 59,576; these, except Kioto and Nagoya, constituting the Treaty Ports, where foreigners can reside or visit without a passport. Though so many Europeans visit Japan, there are few resident; 12,425 out of the 18,970 foreigners resident in 1906 were Chinese, 2,115 English, 1,650 Americans, 670 Germans, 540 French, 193 Portuguese, 93 Dutch, 211 Russians, and 99 Swiss. As a general rule, the liberties of the Treaty Ports extend 10 *ri* [25 miles] in any direction; but Tokio has special limitations, and at Kobe one is not allowed to approach within 25 miles of Kioto without a passport. In return for being confined to treaty limits, foreigners are exempt from Japanese jurisdictions and subject only to their own consular courts. There are also restrictions on import duties. Treaty revision is one of the burning questions of Japan.

Physical Aspect and Climate. The climate of Japan, from the great length of the chain of islands, varies a great deal: the Loochoo and Bonin islands, lying close to the tropics, enjoy perpetual summer, while the Kuriles, in the far north, share the temperature of Kamschatka, due to the cold arctic currents of air and water. The climate of the four great islands and the Loochoos is chiefly regulated and influenced by the monsoons and the Kuroshio, the Japan gulf-stream. The monsoons are warm, southerly winds in summer and cold N. or N.W. in winter. When the S.W. monsoon sets in in April, it brings much rain and a higher temperature, and summer and the rice cultivation commence. Light winds, frequent rain, though sometimes interrupted for weeks, and a comparatively high temperature, distinguish the warm season in Japan, and exert a surprising influence on vegetation. When, again, at the autumnal equinox, the last heavy rains of the season are over, and the prevailing wind is N.W. or N., the dryer season commences. Water disappears from the fields, and the rice harvest is now at hand. By the end of October winter is imminent; the northern monsoon is not only cold, but sometimes very violent; when it blows hard for several days, a clear sky, a high barometer, and low temperature follow. At Tokio the average number of frosty nights is 67, extending from November to March; the mean temperature of the four hottest months, June, July, August, and September, is 74° Fahr.; the highest, 93° to 95° Fahr., being at the end of July or early in August. It has been known as high as 104°. Mention should be made of the violent revolving storms known as typhoons, which

are closely related to the West Indian hurricanes and to the cyclones of the Indian seas. These generally occur in July, August, or September; they cause great damage, not only to shipping, but also to property on land. Large trees often snap like twigs, while the roofs and chimneys of foreign-built edifices suffer severely. As a rule, one of these storms is experienced every year. No country has been more scourged with earthquakes than Japan; they are so frequent that a seismological society has been formed, with its headquarters in Japan, under Mr. John Milne, F.R.S. Destructive earthquakes have often taken place. Tradition says that Mount Fuji was thrown up and the great lake Biwa formed by an earthquake in 282 B.C. The earliest authentic instance was in 460 A.D., when the palace at Kioto was thrown to the ground. In 1702 the Titanic walls of the castle of Yedo were destroyed, in spite of their tremendous *batter*, and the road leading through the pass of Hakone completely closed up. On October 28th, 1891, occurred the most destructive earthquake on record, in which 130,000 houses were destroyed, 10,000 persons killed, and 20,000 injured. The Seismological Society has been able to define the localities most liable to earthquakes, but not to prognosticate their approach; it has discovered, however, that the shock to buildings can be diminished by building them in deep excavations.

The other curse of Japan is floods; they are frequent, especially in early summer, when the snow melting on the mountain ranges causes at times an almost incredible down-flow from the higher lands. These floods occasion great destruction of property, as the rice lands are destroyed by the fine sand from the beds of the rivers swept over the fields during inundation. Whole towns, too, are not infrequently carried away. The rivers, even where of large volume and navigable, are, from the nature of the country, not long. The principal are the Tonegawa, 170 miles long, on a branch of which Tokio stands. The Shinano-gawa and Kiso-gawa, both of which take their rise in the province of Shinano, rank next. Besides these there is Yodogawa, which carries the waters of the Biwa Lake through Osaka into the inland sea, on a branch of which Kioto stands. Navigation is conducted by the Biwa Canal, recently constructed by native engineers, a magnificent work, connecting by a series of locks the great lake with the sea-port. The Isha kari in Yezo is famous for its salmon. The Biwa-Ko (Ko=lake), 50 miles long, and at its broadest about 20 miles broad, is the largest and most noteworthy of the Japanese lakes; its shores are the classical ground of Japanese history. It is equidistant from the Japanese Sea and the Pacific Ocean. After Biwa may be noted the lakes of Chiu-zenji and Hakone, both far above the level of the sea. Chiu-zenji is situated at the foot of Nantai-zan, in the Nikko range. Its scenery has given rise to the proverb that he who has not seen Nikko should not pronounce the word "beautiful." The Hakone Lake lies in the Hakone Hills, just east of Fuji-san; the water is exceedingly cold, and according to Japanese legend has never been fathomed. The hill scenery around is very picturesque, and large

numbers of foreign residents visit it during the summer months. A curious feature of Japan is that, although it abounds in bays and harbours, the natives never name them; such names as Gulf of Tokio, Gulf of Osaka, have been given by foreigners. The most famous piece of protected water is the Inland Sea, cut off from the ocean by the narrow Straits of Akashai and Idzumi at the eastern entrance, and by the Straits of Shimonoseki at the western. The attack on Shimonoseki, in 1864, by an allied squadron of English, Dutch, French, and American vessels, in retaliation for injuries inflicted upon foreign shipping passing through the Straits by the batteries erected by the lord of Choshu, is historical. The current in these Straits is so swift that vessels have difficulty in stemming it unless under steam. The Inland Sea abounds in fertile islands and safe anchorages. The general aspect of Japan alternates between mountain ranges, rugged upland regions, and wide plains, some very sandy. The north of the main island is exceedingly mountainous; in the south-east lies the wide plain of Yedo, remarkably fertile, and closed in by lofty ranges. From this to the west the country is hilly in the centre, with lower ground north and south. The large islands of Kiushiu and Shikoku are chiefly high ground.

Japan, as might be expected in a country where volcanoes are so numerous, is very hilly; in the south there are many mountains of considerable height, the most famous of which is the extinct volcano, Fuji-san, erroneously termed Fusi-yama, which rises more than 12,373 feet in a truncated cone, the most beautiful mountain in the world, depicted so often in Japanese art; its last eruption was in 1707. Next to Fuji-san comes Asama-yama, 8,500 feet, which had an eruption as late as 1870, and Nantaizan, the Sacred Mountain, the loftiest in the Nikko range. Besides these there are the exquisite Hakone Hills, whose blue sierra bounds the horizon of the view from Tokio and Yokohama. The bulk of the population lies in a few great plains like the plain of Yedo.

Government and Statistics. From the time of the Taira and Minamoto up to 1868 the government of Japan was dual, the nominal ruler being the Mikado, the virtual the Shogun or Commander-in-Chief, whose accession was officially confirmed by the Mikado, though as the head of the clan princes or Daimios, and in possession of the eastern and more important portions of the empire, the power was in his hands. When Will Adams conducted an expedition to Japan three centuries ago, the ruler mentioned in his letters was not the Mikado, but the Shogun Iyeyasu, and when Commodore Perry of the United States Navy went to open up Japan willy nilly forty years ago, he dealt not with the Mikado, but with the descendant of Iyeyasu. But in 1868 a few great clans like Satsuma and Choshu rose to help the Mikado throw off the military despotism of the Shogun, and he became Sovereign *de facto* as well as in name. The system of government was then an absolute monarchy, till a constitution was promulgated February 11th, 1889. "By this," according to the Statesman's Year-book, "the Emperor is head of the empire,

combining in himself the rights of sovereignty, and exercising the whole of the executive powers with the advice and assistance of his cabinet responsible to him, and appointed by himself. There is also a privy council, who deliberate upon important matters of state when they have been consulted by the Emperor, who can declare war, make peace, and conclude treaties. He exercises the legislative power with the consent of the Imperial Diet. It is his prerogative to give sanction to laws, convoke the Imperial Diet, open, close, and prorogue it, and dissolve the House of Representatives. The Imperial Diet consists of two Houses, a House of Peers and a House of Representatives. Every law requires the consent of the Imperial Diet. Each House may initiate projects of law, make representations to the government as to laws or upon any other subject, and present addresses to the Emperor. The House of Peers is composed of—1, male members of the imperial family of the age of 20 and upwards; 2, princes and marquises of the age of 25 and upwards (12 princes and 35 marquises); 3, not more than one-fifth of the 90 counts, 362 viscounts, 290 barons, respectively of the age of 25 and upwards, elected by the members of their respective orders; 4, persons above the age of 30 years, nominated by the Emperor for meritorious services to the state or erudition; 5, persons who shall have been elected in each Fu and Ken from among and by the fifteen male inhabitants thereof, of above the age of 30 years, paying therein the highest amount of direct national taxes on land, industry, or trade, and have been nominated by the Emperor. The term of membership under 3 and 5 is seven years; under 1, 2, and 4 for life. The number of members under 4 and 5 not to exceed the number of other members. The entire membership of the House of Peers is to be about 300. The members of the House of Representatives number 379, a fixed number from each election district.

"The President and Vice-President of the House of Peers are nominated by the Emperor from among the members, and President and Vice-President of the House of Representatives are nominated by the Emperor from among three candidates elected by the House. The Presidents of both Houses receive an annual salary of 5,000 yen; Vice-Presidents, 3,000 yen; elected and nominated members of the House of Peers and members of the House of Representatives, 2,000 yen, besides travelling expenses. Anyone is allowed to decline these annual allowances. The Imperial Diet has control over the finances and the administration of justice. Voting is by secret ballot, and the system is that of *scrutin de liste*. The Diet must be assembled once every year. The Cabinet, which is very autocratic according to our ideas, consists of a Minister, President, Ministers of State for Home Affairs, Foreign Affairs, the Navy, Agriculture, and Commerce, Justice, Financial Affairs, the Army, Education, Communications, and various Secretaries. At the head of local administration in the provinces are the Governors, one residing in each of the 46 districts (3 Fus and 43 Kens) into which Japan is divided. In 1879 city and prefectural assemblies were created, based on the principles of

election; their power is confined to fixing the estimates of the local rates, subject to the confirmation of the Governors, and, finally, of the Minister of the Interior. Eligible to the Assembly are all male citizens twenty-five years of age, resident in the district at least three consecutive years, and paying land tax of more than 10 yen annually. The franchise is conferred on all male citizens of 25 years residing in the district, and paying not less than 2 yen land tax annually; Governors are summoned to the Department of the Interior to deliberate upon matters of local administration. Each district is subdivided into cities (*ku*) and counties (*gun*), each with its chief magistrate (*cho*), who manages local affairs. The island of Hokkaido (*Yezo*) has a Governor and a special organisation. To further carry out the principle of decentralisation and self-government, a system of local administration in *shi* (municipality), *cho* (town), and *son* (village) was established by Imperial rescript, April 17th, 1888, which came into effect April 1st, 1889, and is to be applied gradually according to the circumstances and requirements of these localities."

The *army* consists of about 225,000 men on a peace footing, and may be increased to 1,000,000 in time of war. The *navy* has developed in a most extraordinary way of late years; an extensive ship-building programme has been laid down, which provides for 62 battleships and cruisers, and about 100 torpedo boats; at present the navy is manned by 36,080 officers and men.

Estimated public revenue, 1907-8 ...	£61,645,534
Estimated public expenditure, 1907-8 ...	£61,644,104
Total debt, March, 1907 ...	£221,772,275
* Total imports, 1906-7 ...	£42,750,878
* Total exports, 1906-7 ...	£43,258,312
* Imports from United Kingdom, 1906-7 ...	£17,344,929
Exports to United Kingdom, 1906-7 ...	£7,368,249

The *history* of Japan is not important, except where foreigners touch it, till the revolution of 1868, when the Shogun was declared an usurper and the great clans of Satsuma, Choshin, and Tosa warmly espoused the cause of the Mikado. The Shogun himself had resigned in 1867, and this virtually settled the question; although some desultory fighting occurred both at Yedo and near Hakodate two years afterwards. In 1894 war broke out between China and Japan, in which the Chinese were completely defeated; peace was agreed to in 1895, the terms including the independence of Korea, and payment of a large indemnity by China. Since then Japan has assumed a very important position in the Far East. In 1902 an alliance with Great Britain was entered into. In 1904, after protracted negotiations, war broke out between Russia and Japan. Japan at once secured an overwhelming advantage at sea and succeeded in driving the Russians out of Korea and isolating Port Arthur. They then advanced steadily through Manchuria. Port Arthur surrendered in January, 1905, and the Russian army was driven back towards Mukden; meanwhile internal affairs in Russia assumed a very threatening character. After another defeat on land for Russia, and the annihilation of the Baltic Fleet in 1905, negotiations for peace were set on foot, and terms were eventually agreed upon where-

by Japan secured supremacy in Korea, the evacuation of Manchuria by the Russians and its return to China, the surrender by Russia of the leaseholds in the Liao-tung peninsula with Port Arthur and Dalny, the possession of the Eastern Railway from Harbin to Port Arthur, the possession of the southern half of Saghalien, fishing rights in Siberian waters, and pay for maintenance of Russian prisoners. Great Britain concluded an offensive and defensive alliance with Japan in 1905.

Characteristics. The Japanese have a drink peculiar to themselves—*sake*, brewed from rice. Where they have water the bluffs are cultivated to the very tops with paddy-fields (rice). There are immense avenues of cryptomeria (Japanese cedar and pine); on the road from Tokio to the temples of Mikko, there is one nearly fifty miles long. The principal forests consist of these trees, with the ilex, maple, mulberry, and giant camellia. Of fruit trees Japan possesses the orange, apple, walnut, chestnut, plum, persimmon, damson, peach, vine, and loquat. The Japanese carry to extraordinary perfection the cultivation of certain flowers, such as the double plum, peach and cherry blossoms, the wistaria, camellia, chrysanthemum, iris, and tree peony. The most valuable vegetable products are tea, vegetable wax, camphor, cotton. The Japanese eat hardly any meat or bread—fowls, fish, eggs, and rice, with various sauces, forming their savouries. The wild animals are bear, deer, antelope, fox, monkey, badger, etc., the larger chiefly confined to Yezo. The horses are mere shaggy ponies. Among birds are the stork, cor-morant, swan, various kinds of geese and ducks, pheasant, woodcock, pigeon, plover, snipe. Among fish are herrings, bonito, cod, sole, crab, lobster, salmon, eels, oysters. The most esteemed is *tai*, a large species of carp.

Religions and Temples. Japan has two religions, as it formerly had two authorities, the *Shinto* and the *Buddhist*; by the former is meant the religious belief of the natives prior to the introduction of Buddhism. Shinto means literally the "way of the gods." No concise definition of it appears to exist; it contains no moral code, a high Japanese authority on the subject even asserting that in Japan there was no necessity for any system of morals, as every Japanese acted right if he only consulted his own heart. In *Shinto* Japan is held to be the country of the gods, and the Mikado the direct descendant and actual representative of the sun-goddess. In it there also seems to be mixed up a system of hero-worship, many renowned warriors and other personages of ancient days being exalted into what we should term demi-gods; thus it inculcates a reverential feeling towards the dead. By it, too, spiritual agencies are attributed to the elements or natural phenomena. The *Shinto* shrines throughout the country are very simple, being generally constructed of white wood unadorned by brilliant colouring as in Buddhist temples, and roofed with thatch. Before each shrine stands one or more *torii*, archways formed of two upright posts with a projecting cross-bar laid on their summits, beneath which is a smaller horizontal beam, the ends of which do not project. The most famous Shinto shrines are the

temples of Ise—the Mecca of Japan. The special peculiarity distinguishing pure Shinto shrines from Buddhist temples is the absence of images; but they nearly always contain some object in which the spirit of the deity has its shrine, such as a mirror for the sun-goddess or a sword for the god. Buddhism was introduced into Japan in 552. [BUDDHISM.] The most famous Buddhist temples, with a bewildering richness of painted carving outside, and the finest gold lacquer in the world within, are the mortuary shrines of the Shoguns at Nikko, Shiba, and Ueno. There are two famous colossal bronze statues of Buddha in Japan—the Nara Daibutsu, 53 feet high, cast in A.D. 749 (its head, destroyed by fire, has twice been renewed, in 1195 and 1567), and the much more beautiful Daibutsu at Kamakura, 49 feet 7 inches high, cast in 1252. In 1904 there were 83,371 Shinto priests and 1,100 students. There are said to be over 14,000 Shinto gods. There are 250,000 professing Christians of various denominations. Japan swarms with missionaries of all sects. Tokio has even a Greek Church.

Industry : Commerce : Communication. The Japanese are a manufacturing and agricultural people. The land is chiefly cultivated by peasant proprietors, the holding being very small as a rule, and devoted to rice. Out of the 147,697 square miles some 5,229,000 acres are under cultivation, 7,162,000 acres forest, 1,166,000 open field, *i.e.* of land owned by private persons and local corporations. Of the cultivated land, in 1906, 8,000,000 acres were devoted to rice, 1,100,000 acres to wheat, 1,600,000 to barley, 1,800,000 acres to rye. In 1906 there were raised about 57,000,000 lbs. of tea, 136,000,000 lbs. of sugar, 17,000,000 lbs. of raw silk. The principal metals are silver, copper, and iron; the principal minerals coal and sulphur. In 1905 Japan had about 1,670,000 cattle and 1,367,000 horses. There are over 370,000 fishing boats, and over 2,500,000 people engaged in fishing. In 1905 silk and cotton, etc., were manufactured to the value of 157,745,229 yen (2s. 0½d.), and 230,000,000 to 240,000,000 lbs. of cotton yarn; the other leading industries being ship-building, paper-making, matches, soap, ropes, cement, glass, bricks, porcelain, lacquer, bronze, etc. The principal exports in 1905 were raw silk and cocoons, 71,843,755 yen; tea, 3,126,989 yen; rice, 5,086,987 yen; coal, 10,360,762 yen; copper, 2,566,233 yen. Cotton manufactures, 13,684,283 yen; cotton yarn, 33,876,696 yen; matches, 16,048,452 yen; camphor, 10,584,323 yen; matting, 5,324,344 yen. The principal imports were: raw cotton, 110,623,183 yen; sugar, 13,710,885 yen; wool, 8,347,568 yen; iron, 32,649,237 yen; petroleum, 12,061,262 yen; arms, machines, 23,572,908 yen; rice, 47,981,265 yen; oil-cake, 10,695,049 yen; locomotives, 2,466,561 yen. Trade is chiefly with America. Exports, 1906, 423,668,929 yen; imports to Japan, 418,802,829 yen. Great Britain, exports, 101,311,362 yen; imports, 22,553,409 yen. France, exports, 4,997,159 yen; imports, 40,288,876 yen. China, exports, 57,396,737 yen; imports, 27,779,533 yen. Germany, exports, 42,500,013 yen; imports, 8,396,132 yen. Siam, exports, 3,191,281 yen; imports, 235,365 yen. Korea,

exports, 8,205,492 yen; imports, 25,209,796 yen. The staple imports from Great Britain are cottons and woollens, iron, machinery, and chemicals.

The merchant navy in Japan in 1906 consisted of 1,492 steamers and 4,044 sailing vessels of European build (1,378,141 tons). Japan has one of the principal steamship companies of the world, the Nippon Yusen Kaisha, capital £2,000,000, wholly subscribed by Japanese. The fleet consists of over 60 vessels, including 52 large steamships, while new vessels, with all modern improvements, are continually being built, chiefly on the Clyde, to meet the rapidly increasing trade between Japan, Korea, China, the Pacific ports of Russia, Hong-Kong, and the Sandwich Islands. Japan is as well lighthoused as most western nations. Though all have been erected by foreign engineers during comparatively recent years, there is hardly a promontory or island lying in the direct track of shipping without a lighthouse. There were over 4,808 miles of railway open in March, 1907, and lines in construction in every direction, but the rolling stock is not luxurious. In 1906 there were 16,700 miles connected by telegraph, and 3,332 by telephone, 2,197 telegraph offices, and 32 exchange and 157 calling telephone offices, with 36,696 subscribers; 23,083,837 telegrams were sent. In 1907 the Imperial Post Office delivered 289,018,836 letters, 175,566,958 newspapers and periodicals, 23,149,893 books, 15,115,872 parcels. There are over 21,000 miles of road, 5,000 being state-roads. The great state-roads of Japan are famous: the principal highways are 11 in number, the best known to foreigners being the Tokaido, 320 miles long, and the Nakasendo, 330 miles long, both connecting Tokio and Kyoto, and the Hokkaido, running right through the island of Yezo. There are few carriages in Japan, except those belonging to the Court and high officials and legations. The vehicles most in use are a few trams and omnibuses in Tokio, small stage waggons of various sizes like old-fashioned carrier's carts, jinriksha and kagos—the latter rude basket-work palanquins, carried by a couple of coolies, used for the mountains or where there are no roads. At a few places saddle horses may be hired. But the ordinary conveyance of Japan is the jinriksha, a sort of light two-wheeled buggy drawn by a coolie (or for long or difficult journeys by two coolies). The coolie can run about six miles an hour, and do his thirty miles a day comfortably. Strangers in treaty ports pay about 6d. an hour, natives in the country about 2d.

In Japan everything is reckoned in yen (dollars), present value about 2s. 0½d, and sen (cents). There are gold 20-, 10-, and 5-yen pieces, silver and paper yen, silver 50-, 20-, and 10-sen pieces, nickel 5-sen pieces, and copper 1- and 2-sen pieces, besides the base-metal coins of lower denominations; a yen = 100 sen. The present monetary law came into force from October, 1897, by which a gold standard was adopted. The total coinage issued from the mint from its foundation in 1870 up to March 31, 1907, exclusive of recoinage, amounted to 643,101,545 yen. Recently some of the national banks have taken foreigners' accounts, like the foreign banks in Yokohama, Kobe, and Nagasaki; but as late as

1891 there was no bank with the ordinary facilities in Tokio.

The articles of manufacture by which Japan is best known to the world are its silks, porcelain, pottery, lacquers, bronzes, carvings, cloisonné, and sword-blades. Japanese ceramic art dates, roughly speaking, from the year 1600; it reached its zenith about 1750-1830. The most famous kinds are the Hizen, Kyoto, Satsuma, Kutani, Owari, Bizen, Takatori, Banko, Izumo, and Yatsuhiru. There is an immense shipment of low-class porcelain made for the European markets from Nagasaki.

Law and Police. Crime is common in Japan in spite of the gentleness of the people. There were, at the close of 1905 over 52,000 people in prison; the police are much in evidence. Each of the 49 Fus and Kens has a *Court of First Instance*, besides nearly 300 *Courts of Peace* for petty offences. There are seven *Courts of Appeal*, having appellate jurisdiction over civil and criminal cases decided in the *Courts of First Instance*, and there is a *Court of Cassation* at Tokio, which takes cognisance of civil and criminal appeals. In 1905 there were 3,251 serious crimes, and 64,302 lesser.

Education.—Tokio has a magnificent university, with five faculties: law, literature, science, engineering, and medicine. The college of medicine is under exclusively German influence, though there are also some Japanese professors. The other colleges have chiefly Japanese, German, and English professors. The students numbered, in 1907, 4,801, the Japanese showing a special aptitude for engineering and other sciences in which mathematics are applied. Other Government educational establishments are—the Higher Normal School, Higher Commercial School, the Technological School, the Nobles' School, the naval and military academies in Tokio, and six higher middle schools in the provinces. The 27,417 elementary schools in 1906 had 109,000 teachers, and 5,300,000 pupils; in 1906 Japan had 101 libraries with 1,277,010 volumes; 27,095 books were published, and 1,775 periodicals in circulation. Several foreign newspapers are published at Yokohama and Kobe. The native press is under strict censorship, suppressions, fines, and imprisonment being of almost daily occurrence.

Ethnology.—The present inhabitants of Japan are a Mongoloid people who, according to the national traditions, arrived from the south and south-west, and gradually spread over the Archipelago, driving the original Ainu inhabitants northward to Yezo. Many doubtless arrived from the southern Malay lands; but their speech and other indications show that most probably the majority, or the dominant classes, came from Korea. Evidences abound of the intermingling of both races, resulting in a distinct Japanese type, the salient features of which are a flat forehead, great distance between the eyebrows, nose small but well formed with raised nostrils, no glabella nor any depression at the root of the nose, small black eyes slightly less oblique than the Chinese, long black hair, scant beard, sallow or dirty olive-yellow complexion, but almost fair amongst the upper classes, low stature, averaging not much above five feet.

Their arrival cannot date from a very remote period, for the Yebisu-no-Kuni ("land of the savages") still comprised the northern extremity of Nippon so recently as the 7th century of the new era; nor was the Mikado's authority completely established over the whole of Japan proper till the beginning of the 9th century. Compared with the Chinese the Japanese are a feeble folk, with slight muscular development, contracted chest, and a marked tendency to anæmia, due partly to the hot, damp climate, partly to the poor and monotonous national diet of rice varied with a little fish or pickled vegetables. Nevertheless, the lower classes are vigorous, pliant, nimble, great runners, acrobats and wrestlers, with remarkable staying powers, in



JAPANESE MAN AND WOMAN.

apparent contradiction to their generally weak constitution. They are extremely industrious and painstaking in all their pursuits, hence the extraordinary perfection to which certain arts, such as porcelain, pottery, jappanning, metal work and decorative painting, have been brought. Morally and intellectually they rank far higher than the Chinese, being highly intelligent, progressive, bright, quick-witted, genial, cheerful, and brave to a degree of heroism unsurpassed by any nation. The sense of personal honour became a passion under the mediæval feudal system, and led to astounding acts of devotion and self-sacrifice, as well as to deeds of incredible ferocity, of almost daily occurrence. The imitative faculty surpasses even that of the Chinese, as shown by the fact that their first steamer with engines complete was constructed solely from a description in a Dutch treatise on the subject. The *yamato*, or primitive Japanese language, is polysyllabic, euphonious, and agglutinating, showing remote affinities with the Korean, but none with the Malay. The structure is extremely simple, with no true declension or conjugation, the formative relations being indicated by post-positions and auxiliaries. It is spoken in its purity only amongst the highest classes, being replaced in other circles by the Sino-Japanese, in which Japanese and Chinese words are intermingled in about equal proportions. The numerous writing systems are also all based on the Chinese ideographs, out of which have been evolved the *katakana* ("side script"), and its cursive form the *hiragana* ("united script"), a system of forty-seven characters possessing syllabic force, and consequently an immense advance on the Chinese ideographic method, though still inferior to the perfected alphabetic system of the western nations.

Japan Copper, a commercial variety of copper which possesses a fine purplish-red colour owing to the presence of a thin coating of red oxide of copper. It is obtained by casting water upon the molten or hot metal, or by casting the metal in ingots under water.

Japanese Sparrow (*Liothrix luteus*), one of the Indian hill tits, ranging to China and Japan. The plumage is olive-brown, with an orange patch on the breast, and each wing-feather is edged with deep orange.

Japanning. The term japanning is applied to a mode of lacquering articles which is extensively practised in Japan, as in the formation of the well-known Japanese papier-mâché tea-trays, etc. For such articles a lacquer obtained from certain Japanese trees is employed, being laid on in successive coats and each thoroughly dried in the sun before the application of the next, until finally a thick, hard, glossy coating is obtained. Different designs may be painted on the article in gold or colours before the application of the final layers. For the japanning of metals the article must be first well cleaned, smoothed, and dried, and is then coated with a layer of lacquer or japan. Each layer is dried by placing the metal in an oven kept at a constant temperature, the regulation of the heat being an important point in the operation. Another layer is then given and again dried, etc., each coating giving a better surface than the previous one, and, if desired, the final layer may be subjected to artificial polishing. Japans of various colours may be employed, formed by mixing pigments of the desired shade with varnish. The latter usually consists of shellac, or a mixture of shellac and resin dissolved in methylated spirits, while as pigments, ivory black, lamp black, white lead, king's-yellow, etc., may be used. In lacquering wood, papier-mâché, plaster, etc., articles, other varnishes specially adapted for the particular purpose are employed, and the articles are dried without making use of the ovens employed for metal work.

Japan Wax, a white, brittle wax with a peculiar resinous odour, which is obtained from the fruit of certain plants, e.g. *Rhus sylvestris*, which occur in Japan and China. It melts at about 54° F., and has a specific gravity from .98 to 1.01, so that it usually just floats on water. It is employed for a variety of purposes, as for polishing furniture, in the manufacture of candles, perfumery, etc.

Japura, or **CAQUETA**, a tributary of the Amazon, has its source in the Colombian Andes, about 25 miles from the town of Mocoa, Colombia, and after a south-easterly course of some 700 miles, during which it skirts the N.E. boundary of Ecuador and enters Brazil, it joins other tributaries near San Antonio de Maripi, previously to their entering the mother stream some 100 miles further south. It is navigable for about 500 miles.

Jargon, or **ZIRCON**, a rare mineral, in which Klaproth (1789) first indicated the presence of the

element *zirconium*, the compound consisting of a silicate of that metal $ZrSiO_4$. It forms crystals somewhat resembling diamonds but heavier; specific gravity 4.5, and not as hard. It is frequently coloured blue, green, or orange, the latter being the variety most prized as gems. Jargon is found in a number of localities, but Ceylon is the chief source of the mineral.

Jaroslav, a city, the capital of a government of the same name, in the centre of Russia, stands near the right bank of the Volga, and is about 170 miles N.N.E. of Moscow. Its history dates back to the 11th century, and it was for three centuries the capital of an independent principality. The present city has a quay two miles long, and is an important river port, trading largely in corn; cotton stuffs are manufactured in the town, and spinning and weaving employ many inhabitants of the governmental area. Jaroslav is an archiepiscopal see, and has many churches and monasteries, as also a lyceum for law students.

Jarrah (*Eucalyptus marginata*), one of the most valuable timber-trees of Australia. The trees reach a great size, yielding squared logs forty feet long and twenty-four inches across. The wood is hard, heavy, mahogany-red in colour, sometimes beautifully figured, and containing a resin which enables it to stand exposure and to resist the action of sea-water, of ship-worms or of white ants.

Jarrow, a town on the S. bank of the Tyne, 7 miles S.E. of Newcastle. The ruins of the 7th century Benedictine monastery, in which Bede spent his life, are near the parish church, in which is his chair. The modern town dates its rapid rise from the year 1859, when the docks were begun. Ship-building, iron-founding, the making of engines, and the manufacture of chemicals, employ a large number of hands, and much coal is shipped hence. The town received its municipal charter in 1875, Pop. (1901), 34,291.

Jasher, **BOOK OF**, or, according to the revised version, *Jashar*, is one of the lost books of the Hebrew Scriptures. It is quoted twice, Joshua x. 13, and 2 Samuel i. 18. It has been the subject of much speculation; Talmudic and other Jewish authorities variously identified it with Genesis, Deuteronomy, Judges. Dr. Lowth, Herder, and others, following the Syriac and Arabic translators, think that it was a collection of national ballads. Gessenius inclines towards this view, thinking that its name, "the Book of the Upright," arose from the fact that the personages dealt with were upright; whilst Donaldson thinks that it is a work of Nathan and Gad, written during the reign of Solomon. Three forgeries under this name appeared in the 13th century and another in 1751.

Jasmin, **JACQUES** (1798-1864), Gascon poet and barber, was the son of a tailor at Agen. His real name was Boé. The young Jacques set up as a barber in his native town, but in 1835 published some poems in the dialect of Languedoc. He afterwards published three other volumes, which he called "Papillotos" (curl papers). Among

these were "L'abuglo de Castélcuillè," which Longfellow translated as "The Blind Girl of Castélcuillè," "Françonnetto," and "Charivan," a mock heroic poem. He went about giving public recitations of these, and attained a wide popularity which extended even beyond France. He received a pension from the Académie, and a golden crown from his native town.

Jasmine, or JESSAMINE, the popular name of various shrubs belonging to the genus *Jasminum*, which gives its name to the gamopetalous order Jasminaceæ. Of some sixty species, more than forty are cultivated in our gardens, most of them being natives of the warmer regions of the Old World. They have opposite pinnately compound leaves of one, three, five, or seven leaflets, and cymes of fragrant white or yellow flowers. The calyx is tubular, with narrow limb-segments, and the corolla has a long tube and spreading segments, generally five in number. There are two included stamens and a two-chambered ovary. *J. officinale* is the common white jasmine; *J. sambac*, the white Arabian jasmine; *J. grandiflorum*, the Spanish or Catalonian jasmine, a native of Tobago; *J. fruticans*, the common yellow jasmine; and *J. nudiflorum*, the species which flowers before the appearance of its leaves. *J. grandiflorum* is largely cultivated for its perfume at Cannes and Grasse. In China 10 lb. of the flowers of *J. paniculatum* mixed with 30 lb. of those of *J. sambac* are added as a perfume to 100 lb. of tea.

Jason, grandson of the god Poseidon (Neptune), led the expedition of the Argonauts in quest of the golden fleece. He first married Medea (q.v.), but afterwards repudiated her for Glauke, daughter of Kreon, King of Corinth. His first wife took a terrible revenge, which is the subject of the *Medea* of Euripides (q.v.). The story of the fleece is supposed to be an Ionian sun-myth.

Jasper, an opaque, impure, non-crystalline form of silica, generally red from iron peroxide or brown from its hydrous form. These colours occur in bands in *ribbon jasper*. Bloodstone or heliotrope (q.v.) ought apparently to be classed with the opaque jaspers rather than with the translucent chalcedonies. The jasper of the ancients seems to have been green and translucent, a prase, chrysoprase or plasma.

Jassy, the ancient capital of Moldavia, is mentioned as early as the 14th century. It was burnt by Sultan Soliman in 1538, and by John Sobieski in 1686. It gave its name to the treaty concluded between Russia and Turkey in 1792.

It is situated about 200 miles N. of Bucharest, to which, since the formation of the united state of Roumania, it stands in the position of Edinburgh to London after the Union. It is still, however, the residence of a prefect, and the seat of an archbishop. It has also a university and a large hospital. A large proportion of the population are Jews. There is some river trade with Galatz.

Jats, a widespread aboriginal people of North-West India, Afghanistan, Baluchistan, and Persia,

about whose relations the most contradictory view have been advanced by ethnologists. The word *Jat* has been connected with the *Getae*, whom Grimm and others suppose to have been *Goths*, and the most prevalent opinion at present is that the Jats really were Aryans, though of a different branch from the Hindus, and possibly Teutonic. The fact remains that they are at present of distinctly Aryan type and speech, the Jatki language being a neo-Sanskritic dialect allied to the Panjabi and spoken by about 1,800,000 in the Indus basin alone. Jat tribes are found scattered all over Baluchistan, some settled peasantry, some nomadic camel-breeders, others even itinerant like the Gipsies, but all now Mohammedans. In Zachi they cannot be distinguished from the aborigines, and seem allied to the Jataks and to the Jattâkis of the Jatak Hills, Brahuik Range. In the Panjab they are mostly Sikhs, that is, members of Nanek's sect and in Rajputana, where they form the substratum of the population, they are Hindus chiefly of the Vaishnava sect. If the Sikhs be taken as a typical branch of the family, then the Jats must be pronounced one of the finest races physically in the world. [SIKHS.] But the type varies greatly, and some of the peasantry are of low stature, with small eyes, prominent cheek bones, and very dark complexion.

Jaundice is the term applied to the condition in which the colouring matter of the bile circulates with the blood, and is deposited in the tissues instead of being removed from the body by way of the alimentary canal. Though non-elimination of colouring matter is the striking visible sign, the symptoms of jaundice are probably due to the retention within the system of other constituents of the bile. In determining the existence of jaundice, it is important to note whether the conjunctivæ are discoloured, as, in several maladies which simulate the disease, the conjunctival mucous membrane is not affected. Again, in jaundice there is an alteration in the colour of the discharges from the lower bowel, while there is, on the other hand, an increased amount of pigment in the urine. In some cases of jaundice there is obvious obstruction to the passage of the bile from the bile duct into the duodenum; as, for example, by a calculus, or by pressure from abnormal growth in parts surrounding the duct. In the case of what is known as catarrhal jaundice, it is assumed that inflammation of the mucous membrane of the duct leads to obstruction to the flow of bile through it. As there is some doubt as to the existence of this inflammatory condition in all cases, it is better to employ the term *simple jaundice* in such instances. Jaundice is produced by certain poisons, notably phosphorus; it also occurs in some forms of acute disease, and is a characteristic symptom in yellow fever. It may be produced by disorganisation of the substance of the liver, and by interference with the circulation of blood through it, such as occurs in the various hepatic disorders. Lastly, what is known as malignant jaundice should be especially alluded to. This malady is sometimes spoken of as acute yellow atrophy of the liver, and in it the

symptoms rapidly assume a serious character, with grave cerebral disturbance, and death usually occurs within a week. In simple jaundice, which is the most common form in which jaundice presents itself, the symptom subsides in the course of a few weeks, and it seldom calls for special treatment beyond the regulation of the digestive functions.

Jaunpur, a town and district in the north-west provinces of India. The town, which stands on the Gunti river, was once the capital of a Mohammedan kingdom. Traces of its former glory are to be seen in Ibrahim's baths (15th century), and the ruins of mosques. Jaunpur was a centre of disaffection during the Mutiny. It has two railway stations, and a considerable trade.

Java, a large and fertile island in the East Indies belonging to the Dutch, lies between 5° 52' and 8° 51' S. lat., and 105° 15' and 114° 35' E. long. It is separated from Sumatra by the Sunda Strait on the west, and from Bali by the Strait of Bali on the east. It is 630 miles long (west to east), and varies in breadth from 60 to a little over 120 miles. Including Madura and some smaller islands, the total area of Java is nearly 52,000 square miles.

History.—Hindu states began to be formed in the island from the 9th century onwards; Mohammedanism was introduced at the beginning of the 15th century; and in the next century the Dutch came. Their East India Company, after a struggle of three centuries with the natives, gradually extended its dominion over the whole of Java. During the Napoleonic wars the French seized the kingdom of Bantam, but the whole island was soon after occupied by the British and held by them till 1817. A rebellion against the Dutch broke out in 1825, and lasted for five years, after which their hold on the island was permanently secured.

Physical Features, etc.—Java is very mountainous, and contains a large number of volcanoes, many of which are still active. The highest, Semeru, is more than 12,000 feet high. There are very few large rivers. Some large bays on the north of the island contain good harbours. The temperature is continuously high, but is seldom extreme. The rainy season is from November to March; in the west there is more rain than in the east. The vegetation is very rich, and varies according to altitude. The flora of the highest region is European in character. There is a little gold, but minerals of all kinds are rare. There are large forests, but little timber is cut. The rhinoceros is the largest mammal found in Java. Wild swine abound, and there are not a few tigers in the forests, while the leopard is also common; there are two species of deer, and crocodiles and several kinds of serpent are found. Java is remarkable for its bats, specially one known as the flying-fox. The birds are unimportant.

Agriculture, Trade, etc.—Rice and maize are largely grown, chiefly for native consumption. Coffee and sugar are cultivated for exportation, and have brought great wealth to the Dutch Government. By a system introduced by Governor van

den Bosch in 1830, the natives were made to work the plantations and sell at a fixed price to the Government magazines. This was much disliked by the cultivators, and was to a large extent modified in 1873; but so late as 1889 a commission was appointed to consider the question of coffee-planting. Tobacco and tea are also exported, the trade being chiefly with Holland, the Straits Settlements, and Great Britain.

Administration, etc.—Java is governed by a governor-general and council. It is divided into twenty-two residencies, each under a European official, who has judicial, financial, and administrative functions. A native functionary known as the regent, appointed by the governor-general and paid by the government, has important consultative functions, but little executive authority. Europeans form but a small proportion of the population; the rest are Malays, divided into Javanese, Sundanese, and Madurese. Batavia is the capital, Sombaya and Samarang, on the northern coast (the former opposite Madura), being the towns next in importance to it. Communication by roads and railways is good, and the telegraph system is efficient.

Ethnology. Java was originally inhabited by a Negrito people akin to the Aëtas of the Philippines, of whom the last survivor, a gardener in Buitenzorg, died about the year 1886. The present population forms four distinct ethnical groups, all of Malay stock: 1. The *Sundanese* in the west, as far as the province of Cheribon, distinguished both by their rude Malay dialect and by their coarse physical type, vigorous constitution, and independent bearing; 2. The *Javanese* in all the central districts from Cheribon inclusive, east to the meridian of Madura Island, of softer physique and more refined habits; head highly brachycephalous; small nose, less flat and broad at base than that of most Malays, face more elongated, cheek bones less prominent, black hair and eyes, yellowish-brown complexion, short stature, averaging five feet three or four inches; 3. The *Madurese* in the extreme east and adjacent island of Madura, not differing greatly in appearance from the Javanese, but of somewhat ruder habits and speech; 4. The true *Malays*, forming numerous trading communities in all seaports along the north coast. Although, like all Malays, subject to occasional fits of uncontrollable frenzy, the Javanese are generally of a mild disposition, peaceful, industrious, and skilled in many crafts, such as metal working, weaving, dyeing, pottery, as well as in the arts of music and poetry. They are excessively polite and ceremonious, as shown in their soft Malay language itself, of which there are no less than four distinct forms. 1. *Krama*, the noble style, used by inferiors to superiors; 2. *Ngoko*, the simple style, used by superiors to inferiors; 3. The *Madhya*, used by equals to equals; 4. The *Basa Kraton* ("Court language"), used in presence of princes. Besides these there is the extinct *Kavi*. The earliest Javanese culture was developed under Hindu influences, and the bulk of the people were followers of various Brahmanical sects down to the close of the 15th century, since which time all have been Sunnites (orthodox Mohammedans), though retaining many

Hindu practices. They also retain the writing system based on the Indian Devanagari, whereas the Malays proper, like most other Mohammedans, have adopted the Arabic alphabet, though ill suited to express the sounds of their melodious speech.

Java Sparrow, or Rice-bird (*Amadina oryzivora*), a well-known cage-finch, about the size of a house-sparrow. The plumage is bluish gray, with white ear-coverts.

Jaxartes, or SIR-DARIA, a river which rises in the Thian-Shan mountains between China and Turkestan, at a height of 12,000 feet. It has a total course of 1,500 miles, and is navigable for about 800 miles from its mouth. It bears three separate names in its descending course, and is not called Sir-Daria (river) until about the middle of its length. From Khojend, some way above this point, it takes a northerly direction, and ultimately empties itself into the sea of Azal below Aralsk. Its water is used for irrigation purposes like that of the Nile.

Jay, any bird of the Corvine genus *Garrulus*, with twelve species from the Palæarctic region. The Common Jay (*G. glandarius*) is British, and one of the handsomest of our native birds. The adult is about 13 inches long. General plumage—vinous-red above, paler on the under surface, fading



JAY (*Garrulus glandarius*).

into white on the vent and under tail-coverts; the black wing-coverts are barred with blue and white, and there is an erectile crest of whitish feathers streaked with black. Like the rest of the genus, it is an omnivorous feeder, devouring the farmer's fruit and the eggs of the game-preserver, though it makes some amends by consuming numberless insects and their larvæ and waging war upon mice. It has considerable power of mimicry, and is often

kept as a pet. Allied genera are found in the New World.

Jay, JOHN (1745–1829), an American statesman, was born at New York. After graduating at what is now Columbia College, he went to the Bar and obtained a large practice. He was a delegate to the Philadelphia Congress of 1774, and drew up the Address to the People of Great Britain. He was also a member of the second Congress, but was prevented by absence from signing the Declaration of Independence. He drafted the constitution of New York State, of which he became Chief Justice. In 1778 he was elected President of Congress, in 1780 went on a mission to Spain, and in the following year was appointed one of the commissioners to negotiate the treaty with Great Britain. On his return to America he became Foreign Secretary, and in 1789 Chief Justice of the Supreme Court of the United States. He took an important part in framing the American constitution. He incurred much odium in consequence of the treaty of 1794, negotiated by him with Great Britain, but was, notwithstanding, soon after elected Governor of New York, and re-elected in 1798. In 1801 he retired from public life.

Jay, WILLIAM (1769–1853), a Dissenting preacher of some power, was the son of a Wiltshire stone-cutter. Before he was twenty crowds came to hear him preach in Surrey Chapel, London. After a short time at Chippenham and Clifton he became pastor of the Argyle Independent Chapel at Bath, where he remained for the rest of his life, and was highly esteemed as a preacher. He married for the second time at the age of seventy-seven. He published twelve volumes of devotional works.

Jean de Vienne, French naval hero, was born in 1341, and in 1373 became a sea-commander. In the same year he was appointed Admiral of France, and at once set to work to create a French navy. In 1377 he landed and occupied Rye, and took and plundered Lewes. Later in the same year he sacked Yarmouth in the Isle of Wight, Poole, and Hastings. He fell in action while co-operating with English allies at Nicopolis in 1396.

Jebb, SIR RICHARD CLAVERHOUSE (1841–1905). He went to school at Dublin and afterwards at Charterhouse, and was senior classic at Cambridge in 1862. He soon became fellow of Trinity, and in 1869 was appointed public orator. In 1875 he became professor of Greek at Glasgow University, and in 1889 succeeded Dr. Kennedy in the same chair at Cambridge. His chief works are editions of the Attic orators (1876) and of the plays of Sophocles (1883), a life of Bentley ("English Men of Letters"), and *Modern Greece* (1880). He became M.P. for Cambridge University in 1890, and was knighted in 1900.

Jeejeebhoy, SIR JAMSETJEE, BART. (1783–1859), the Parsee philanthropist, was born at Bombay. As a merchant's clerk he made several voyages to China, in one of which, during the French War, he was captured and sent to the Cape. After his return in 1807 he gradually accumulated by trading a large fortune. This he used to pay

the debts of the Bombay prisoners in 1822, to relieve the sufferers from the Surat fires and rebuild houses there in 1824 and 1837, to provide endowments for the Parsee worship in Bombay and Poonah, and to found the hospital there (1843) which bears his name. He also gave large sums for other purposes subsequently, and in recognition of his munificence was created a baronet in 1857, having some years before been knighted.

Jefferies, RICHARD (1848-87), the popular naturalist, was educated at Swindon, Wiltshire, and at Sydenham. His first novel was published in 1874, but was not successful; but he soon began to contribute to newspapers and magazines, and in 1876 came to London. Next year the publication of his *Gamekeeper at Home*, which had appeared in instalments in the *Pall Mall Gazette*, increased the reputation he had begun to found by a letter to the *Times* on the condition of the agricultural labourer. In 1879 appeared *Wild Life in a Southern County*, which was followed by several similar works. His two best novels were *Bevis* (1882) and *Wood Magic* (1881). He suffered from a painful illness in his later years, and was reduced to great poverty.

Jefferson, JOSEPH, an American comedian, was born at Philadelphia in 1829. He appeared successfully in 1848 in *The Maid and the Magpie*, and in 1857 in *The Sea of Ice*, but his first great hit was in *Our American Cousin*, in which he played Asa Trenchard to Sothorn's Dundreary. In 1862 he came to England, and reached the height of his reputation by his impersonation of Rip Van Winkle at the Adelphi. He again visited London in 1874-77, and played his famous part; he also took Bob Acres in *The Rivals*. He died in 1905.

Jefferson, THOMAS (1743-1826), third President of the United States, was born at Shadwell, Virginia, his father being a large farmer of liberal tastes and great physical powers. Jefferson was admitted to the Virginian Bar in 1767, and practised for eight years with success. In 1769 he became a member of the Virginia Assembly, and in 1774 prepared the draft of instructions to the Virginia delegates at the Philadelphia Congress, which was amended by Burke and circulated in England. In 1775 he became a member of the Virginian committee of thirteen for raising the colony against the British, and the same year took part in the Philadelphia Congress. Jefferson was chairman of the committee which drew up the Declaration of Independence, but resigned his seat very soon after in order to reorganise the institutions of his native colony on the New England model. He refused the appointment of joint-representative of the United States at Paris in order to devote himself to this work. He carried a Bill abolishing primogeniture, and caused the removal of the capital of Virginia to Richmond. The "Act for Establishing Religious Freedom" was also mainly due to him. From 1779 to 1781 he was Governor of Virginia, and did his utmost to support Washington and to defend the state. After this he was elected by Congress a

plenipotentiary to France, but the preliminaries of peace had been signed before he sailed. As chairman of the Currency Committee in Congress, Jefferson, with Gouverneur Morris, brought into use the decimal system of coinage. In 1784 he was sent to France to assist Franklin and Adams in negotiating commercial treaties, and next year became sole plenipotentiary. During his residence in France he published his *Notes on Virginia*. In the year of the French Revolution he returned to America, and was immediately appointed Secretary of State by Washington. He then became the head of the Republican party in the United States. He resigned in 1794, refused to resume office later the same year, and was a candidate for the Presidency in 1796. Having been Vice-President under Adams, he obtained the highest office in 1800, and being re-elected at the end of his first term, held office till 1809. He retained Federalists in office, contrary to the expectations of his friends. His first term of office was marked by the purchase of Louisiana, and during his second he endeavoured to protect America as a neutral power in the contest between France and England by the embargo of 1807. Jefferson's remaining years were devoted to the organisation of public education in Virginia. His *Manual of Parliamentary Practice* was republished so recently as 1871, and is still much in use.

Jeffrey, FRANCIS (1773-1850), the Whig critic and reviewer, was a native of Edinburgh. He was educated at the High School there, and at Glasgow University. He was also for a short time at Queen's College, Oxford, but left it in disgust. On his return to Scotland he became a member of the celebrated Speculative Society, studied law, and was called to the Bar in 1794. His Whig principles prevented his obtaining much practice in Scotland, and in 1798 he tried to obtain a literary opening in London. He then returned to Edinburgh, and in 1801 married. He had previously published essays, and he saw much literary society, being intimate with Sydney Smith, Brougham, and Horner. With their co-operation he in 1802 established the *Edinburgh Review*, of which he soon became sole editor. It was very successful. Scott contributed to it in its first years, but left it as it grew more decidedly Whig. Jeffrey had a share in the Cevallos article (No. 26), but, as a rule, wrote few political articles. He distrusted the Radical wing of the Whig party. In 1806 he had to meet Thomas Moore at Chalk Farm on account of an article in the *Edinburgh Review* reflecting on Moore's *Epistles and Odes*, but the combatants were arrested and bound over to keep the peace before anything had taken place. They were fast friends ever after. His personal popularity now gave Jeffrey a good practice, and he was an effective advocate. In 1812 he went to America, where he married as his second wife a relative of John Wilkes. He took a rather active part in politics during the following years, but in spite of this was elected in 1829 Dean of the Faculty of Advocates. The same year he retired from his editorial chair. In 1830 he was appointed Lord

Advocate and soon after entered Parliament. He carried through the Scottish Reform Bill, but he soon became tired of politics, and in 1834 became a judge (Lord) of the Court of Sessions. He criticised Wordsworth, Scott, Byron, Shelley, and Coleridge with great severity, but was never abusive. Four volumes of his *Contributions to the "Edinburgh Review"* appeared between 1844 and 1853.

Jeffreys, GEORGE, LORD (1648-89), the infamous judge, was a native of Acton, near Wrexham. He was educated at St. Paul's School, at Westminster, under Dr. Busby, and at Trinity College, Cambridge. He afterwards entered at the Inner Temple, and was called to the Bar in 1668. He had a large practice at the Old Bailey and Middlesex sessions, his weakness in law being atoned for by his strength in cross-examination. In 1671 he became Common Serjeant, and six years later was made Solicitor-General to the Duke of York, and was also knighted. In 1678 he became Recorder of the City. His proceedings with regard to those accused of complicity in the "Popish Plot" are notorious. His conduct as Chief Justice of Chester and as counsel for the Crown was animadverted upon in Parliament, and though the king refused to remove him from his preferments, Jeffreys was reprimanded on his knees by the House in 1680, and resigned the Recordership. Notwithstanding, next year he continued to act as Crown counsel, and was created a baronet. He was useful to the Crown in the matter of the remodelling of the Corporation charters; took a leading part in the prosecution of Lord Russell (q.v.), and in 1683, in spite of the low opinion held of him by Charles II., was created Lord Chief Justice. He presided at the trial of Algernon Sidney (q.v.), and conducted it with extreme unfairness; and in 1684 illegally refused the claim of Sir Thomas Armstrong, who had been outlawed, to a trial. Charles II. treated him with much favour, and his successor acted upon his advice in having the customs collected without parliamentary grant. In May, 1685, Jeffreys tried and sentenced Titus Oates, and in the same month was created a baron. His next victim was Richard Baxter. After the battle of Sedgemoor the Lord Chief Justice attained the height of his infamy by his conduct of the Bloody Assize in the western circuit. After this James II. made him Lord Chancellor (September, 1685). As such he defended the Dispensing Power, and was appointed President of the High Commission Court revived by his advice. He then directed the arbitrary proceedings against the universities, and it was by his counsel that the bishops were prosecuted. He had several times previously, however, endeavoured to "hedge," and he was compelled to annul several of the proceedings he had instituted. On December 8, 1688, he surrendered the great seal to James, and a day or two after tried to escape from England disguised as a sailor. He was, however, arrested in a tavern on December 12, and committed to the Tower. He petitioned for a pardon from William III., but died in prison.

Jehovah, an utterable variation of the unutterable JAHVEH, the Hebrew name for the Supreme Being, formed by combining *Jahveh* with *Adonay*, "The Lord." Both *Jehovah* and *Jahveh* are called the *tetragrammaton* or "four-lettered name," vowels not being counted as letters in the Hebrew writing. The name is thought to mean "the eternal" or "the unchangeable." The distinctions between the use of the terms Jehovah and Elohim in the Pentateuch have been the subject of much controversy in recent times. The former seems to have connoted the deity as ruler, preserver, and object of worship; the latter the absolute, unknowable deity and author of being. In short, Jehovah was the God of Israel.

Jejunum, that portion of the small intestine intermediate between the duodenum and ileum. [DIGESTION.]

Jelf, RICHARD WILLIAM (1798-1871), a learned theologian, was the second son of Sir James Jelf. He took orders in 1821, was for thirteen years preceptor to Prince George of Cumberland, afterwards King of Hanover, and in 1830 became Canon of Christchurch. During the Tractarian controversy he preached a sermon entitled "Via Media" (1842), which described his attitude. In 1844, when he was Bampton Lecturer, he was appointed Principal of King's College, London, a post which he held till 1868. By his influence Maurice was deprived of his professorship. Jelf published several lectures and sermons, and an edition of Jewel's works.

Jelf, WILLIAM EDWARD (1811-75), a younger brother of Richard Jelf, distinguished himself at Oxford as a classical scholar. His most important work was his *Greek Grammar* (1842-5), which went through five editions. He was vicar of Carleton, Yorkshire, from 1849 to 1854, afterwards officiated at Caerleon, near Barmouth, and died at Hastings. He was Bampton Lecturer in 1857, and engaged in much controversy with the ritualists.

Jellyfish, a general name popularly applied to a large number of aquatic animals, of which the body is composed of jelly-like substance. The animals included under this term may be grouped into two sets; one may be regarded as pseudo-jellyfish, in which would be included such animals as the minute *Noctiluca*, or the phosphorescent animalcule, which is a Protozoan, and the *Beroidæ*, which belong to the Ctenophora. The other group, or true jellyfish, consists of various types of Hydrozoa (q.v.): it is to this series that the name ought properly to be applied. But even here the jellyfish belong to many different orders and represent very different stages of development. Thus one group are the free-swimming sexual stage of fixed colonies. Thus, in the zoophyte known as *Campanularia*, the gonophore containing the sexual organs is detached as a small free-swimming medusa or jellyfish. These are, therefore, not to be regarded as individuals, but only as organs separated from the parent colony. The next group have fundamentally the same structure, and were, therefore, grouped with these as the Gymnophthalmata

or naked-eyed medusæ; in this case they are, however, not organs, but true individuals, as they give rise directly to jellyfish exactly like themselves. Such is the case with the *Æginidæ* and *Trachynemidæ*. Two parallel groups occur in the Steganophthalmata or covered-eyed jellyfish; thus in one, as e.g. in the common *Aurelia*, the jellyfish is the free-swimming sexual stage of a non-sexual fixed Hydroid; with the other they are produced directly from forms which are either not fixed or but rarely so. All the jellyfish with two exceptions are marine; one of these is the famous *Limnocoedium*, which suddenly appeared in the *Victoria regia* tank at Kew, and the other inhabits Lake Tanganyika. As might be expected with such delicate, soft-bodied animals, they are extremely rare as fossils, but some well-preserved specimens of both *Æginidæ* and *Æquoridæ* occur in the Solenhofen slate.

Jena, a town in the Apolda department of Germany and the grand-duchy of Saxe-Weimar-Eisenach, is pleasantly situated at the junction of the Leutra and the Saale, 56 miles by rail S.W. of Leipsic. It was in existence before 1029, and in the 15th century was acquired by the Electors of Saxony from the Margraves of Meissen, becoming incorporated with Weimar in 1741. The old church of St. Michael has a tower 318 feet high. In the castle (1620) Goethe wrote his *Hermann und Dorothea*. On the Hausberg stands the Fuchsturm, a building regarded with superstitious terror. But the university, founded in 1558, is the chief object of interest. Here Fichte, Schelling, Hegel, Schlegel, and Schiller lectured, and the institution has always been associated with the cause of religious and political freedom. Jena has few manufactures save cigars, pianos, beer, and sausages, but there is some printing and publishing carried on, and the district grows wine and timber. The battle of Jena was fought between Napoleon and the Prussians in 1806, and resulted in the crushing defeat of the latter.

"Jenkins's Ear." In 1738 Jenkins, the master of a trading sloop from Jamaica, declared that he had been boarded by a Spanish revenue vessel, and barbarously deprived of one ear. It is doubtful whether he had not really lost the ear at the pillory; but the story served its turn, and so aroused public feeling in England that war with Spain followed in 1739.

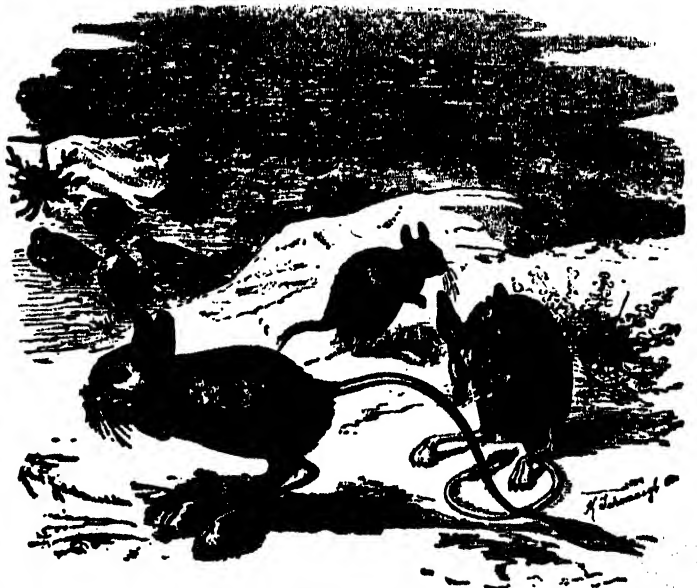
Jenner, EDWARD, was born in 1749. Adopting the medical profession, he became a pupil of John Hunter. He had, when a youth, been impressed with an idea that small-pox and cow-pox were related in such a way that an attack of the one afforded immunity from the other. His serious investigations began in 1775, and were conducted with extreme caution; nor was it until 1798, after he had inoculated a patient with vaccine matter, and found his constitution proof against inoculations with variolous matter, that he ventured to publish his conclusions. The discovery was met by opponents, who denounced it as useless. However, the medical profession at home and abroad, the Court, and the public soon recognised Jenner's merits, and the result in this country was a decrease in the

annual deaths from small-pox to 622 in 1804, the previous average having been 2,018. Jenner spent his later years entirely at Berkeley, where he died very suddenly in 1823.

Jephtha ("the Opener") was driven from his home by his brethren, and settled in Tob, a district of Syria. When close pressed by the Ammonites, his tribe recalled him, and he delivered them from their foes. He made a rash vow that he would sacrifice whatsoever first came out of his house to meet him on his return from battle, and this happened to be his own child. It is to be noted that the passage in Judges (x. 15—xii. 7) does not indicate that the girl was actually killed, but rather suggests that she was condemned to perpetual virginity. Jephtha died after a reign of six years.

Jerba, or GERBA (Anc. Meninx), an island in the Mediterranean, lying close to the coast of Tunis on the S. side of the Gulf of Gabes. It is 22 miles in length from E. to W., and 14 miles in breadth, and is thickly populated. Shawls and woollen goods are manufactured, and many cattle are reared. Besides a triumphal arch of Antoninus, the island contains a curious pyramid of Spanish skulls, erected to commemorate the defeat of Medina Coeli and Andrea Doria by the Turks in 1558.

Jerboa, any rodent of the genus *Dipus*, ranging from South-East Europe and North Africa to China. They are distinguished by the extraordinary length of the three-toed hind limbs, and their mode of progression is a series of jumps so rapid that they seem to skim over the surface like a bird. The Common Jerboa (*D. ægyptius*) is about 6 inches



JERBOA (*Dipus ægyptius*).

long, with a tufted tail of 9 inches. Like most desert animals they are greyish in colour. The Gerbilles, with five digits on all the limbs, are allied, and have a nearly similar range. America has a kindred form, *Zapus hudsonius*, the sole species of the genus, about 8 inches long, the tail counting for five. All live socially in burrows, and hoard grain for food in the winter.

Jeremiah must have been born about the middle of the 7th century B.C. His gift of prophecy was manifested early. His gloomy predictions were resented by Jehoiakim, and he narrowly escaped capital punishment. Jeremiah is believed to have been stoned to death at Taphins about 580 B.C. There can be little doubt that his Prophecies and Lamentations have come down to us in a somewhat "edited" form.

Jericho ("Fragrant," or "City of the Moon") was the first place captured by the Israelites on the west side of Jordan, where it stood near the north end of the Dead Sea, 15 miles from Jerusalem, one of the approaches to which it entirely commanded. The original city was destroyed, and was not rebuilt until the time of Ahab, when the site was perhaps shifted. It still occupied part of the fertile and flowery valley from which it derived its appellation of "the city of palm trees." After suffering severely during the Babylonian Captivity, Jericho experienced a period of renewed prosperity, and was given by Antony to Cleopatra, from whom it passed to Herod the Great. His reconstructed city perished in its turn with the fall of Jerusalem, and another settlement sprang up, the ruins of which are marked by the squalid village of Riha, two miles from the Tell or Spring of the Sultan. For many years this was the seat of a bishopric, but about the 13th century all traces of former prosperity and cultivation faded away.

Jeroboam, the son of Nebat and Zeruah, an Ephraimite widow, was employed by Solomon, against whom he revolted. His schemes were detected, and he fled to Egypt until his master's death, when, recalled by the ten tribes of Israel, he was elected their king. He set up golden calves at Dan and Bethel, and reigned for two and twenty years, being succeeded by his son Nadab.

Jeroboam II. succeeded his father Jehoash as king of Israel more than a century after the death of his namesake, whose evil reputation he emulated, establishing idolatry at most of the places associated with the worship of Jehovah, whilst retaining many ritual observances of the Levitical law. He wrested back from Syria all the provinces lost by his predecessors, and extended his dominions beyond Jordan. After a reign of forty-one years he was succeeded by his son Zachariah.

Jerome, ST., EUSEBIUS SOPHRONIUS HIERONYMUS, was born probably about 340 A.D., his parents being Christians of some wealth. He received a careful education which was completed at Rome, where Pope Liberius baptised him. Returning home with a strong bent towards scholarship, he presently set out on a course of travel. He came back to Aquileia, and there wrote to Innocentius his earliest tractate. A long tour in the East brought him to Antioch, and a severe illness induced him to devote his life henceforth to religion, in pursuance of which object he passed some time as a hermit in the wilds of Chalcis, studying Hebrew and the Scriptures. The Meletian controversy recalled him

to Antioch and ultimately to Constantinople as an opponent of Arianism and a champion of Western orthodoxy. In 382 the Pope Damasus invited him to Rome and set him to supervise the Latin version of the Bible, and he had completed the New Testament, with the *Psalterium Romanum* and *Psalterium Gallicum*, when the death of Damasus in 385 started him once more on a wandering career. His advocacy of the celibate life, especially for women, had provoked hostilities, and accompanied by Paula, Eustochium, and other Roman ladies, he roamed over Asia Minor, Egypt, and Palestine, ultimately settling down at Bethlehem, where four monasteries were built. He now set to work upon the translation of the Old Testament with the help of several Rabbis, and he produced what afterwards served as the basis of the Vulgate. His more peaceful labours included lives of Malchus, Pachomius, and Theodoricus, Eastern recluses; *De Viris Illustribus*, a biographical history of the Church, and Commentaries on the Prophets, St. Matthew's Gospel, and the Epistles of St. Paul. The Pelagian heresy aroused once more all his polemical ardour, and his *Dialogi contra Pelagianos* provoked such ill-feeling that he had to fly from Bethlehem for two years, returning in broken health and dying in 420.

Jerome of Prague was born in the city associated with his name about 1365. He studied at the university there, and then went to Oxford, where he imbibed the principles of Wycliffe. He next visited Paris, Heidelberg, and Cologne, and returning to Prague about 1407 with a reputation for learning, he took the side of Huss in the disputes which led to the secession of the German "nations" from the university, and was invited to assist in organising the new university of Cracow. His open profession of Wycliffe's doctrine and his denunciation of the abuses of the Church brought him into such disfavour that he had to take refuge for a time at Vienna, whence he returned to act again with Huss until the latter was expelled and imprisoned at Constance in 1415. Jerome immediately proceeded to the aid of his friend, but found matters so discouraging that he was on his way back to Bohemia when the Duke of Bavaria caused his arrest. Carried to Constance and closely imprisoned, he abjured the principles for which Huss had already forfeited his life. But in May, 1416, he firmly withdrew the confession previously extorted from him. He was forthwith condemned to the stake and died with the utmost courage.

Jerrold, DOUGLAS WILLIAM, the son of a provincial actor, was born in London in 1803. His childhood was spent at Sheerness amidst the excitement of naval preparations for war, and in 1813 he joined the service as midshipman, but retired at the peace of 1815. In 1821 his first comedy, *More Frightened than Hurt*, was accepted at Sadler's Wells, and he presently got employment as dramatist to the Coburg Theatre, and married in 1824. *Black-Eyed Susan* was produced at the "Surrey" in 1829. Meanwhile Jerrold's pen was always busy in the periodicals, his aim being to effect social reforms by the use of unsparing but not unkindly satire.

Most readers will, however, connect Jerrold's fame with his contributions to *Punch*, and amongst these *Mrs. Caudle's Curtain Lectures* stand first, the *Story of a Feather* coming next. In contemporary society he was celebrated for readiness of wit and keenness of repartee, qualities of which it is difficult to preserve any written record. Jerrold died at Kilburn Priory in 1857, leaving a son, WILLIAM BLANCHARD JERROLD, who inherited some of his talent, and held a prominent position as a journalist until 1884, when he, too, passed away.

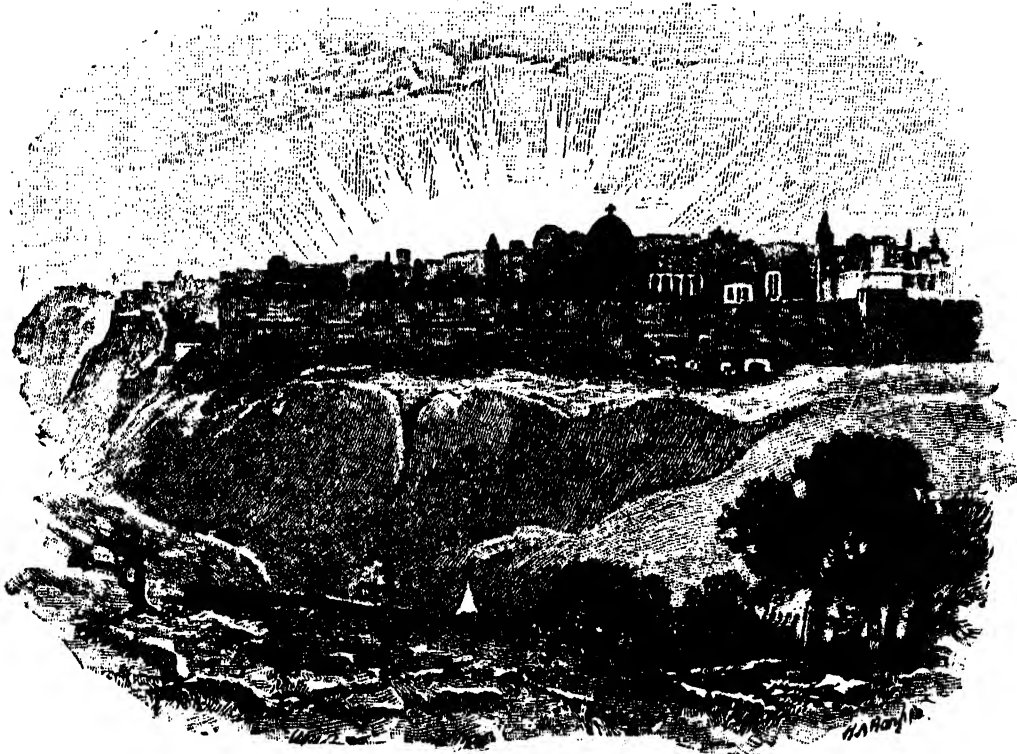
Jersey, the largest member of the group known as the Channel Islands, lies to the W. of the French peninsula of Cotentin, at a distance of 16 miles from the nearest point of the coast and of 95 miles from Weymouth. It is 30 miles S.E. of Guernsey. The length from E. to W. is 12 miles, and the breadth $5\frac{1}{2}$ miles, the superficial area being 49 square miles. The N. coast is bold, high, and rocky, and offers few safe harbours; but the table-land trends to the S., where the sea-level is reached and the outline deeply indented by the bays of St. Brelade, St. Aubin, St. Clement, and Grouville, that of St. Catherine, facing E., also offering some degree of shelter. The approaches, however, on all sides are beset with dangerous rocks and banks, of which the Corbière, the Dirouilles, the Ecrehous, and the Minquières are the most conspicuous. Geologically, the base of the island is syenite, with overlying masses of quartzite, metamorphous sandstone, porphyry, trap and other igneous rocks, interspersed with occasional beds of shale and china-clay. Topping these in many parts is a layer of deep and rich loam, which, under the influence of a genial climate, is highly productive. Cattle-rearing is, however, more profitable than agriculture, the Jersey cows being famous for their milk; and at present potatoes and tomatoes are the only vegetable products that find favour, fruit being little cultivated. The land is mostly in the hands of peasant-proprietors, owing to the prevalence of the French system of subdivided inheritance, and the population generally is thrifty and prosperous. Fishing affords a livelihood to many inhabitants, and lobsters are exported in considerable quantities. The name of the island is a corruption of Cæsarea, and traces of Roman occupation are not lacking, whilst cromlechs attest the existence of an originally Keltic race. St. Maglorius introduced Christianity in the 6th century, and in 916 the island was ceded by Charles the Simple to Rollo of Normandy. It practically became united with the Crown of England at the Conquest, and in spite of many endeavours to recover it, the latest being foiled by Major Pierson in 1781, possession has been held continuously by England since the time of Henry I. It is governed by the "States," an assemblage consisting of a bailiff or judge with twelve jurats of the Royal Court—the first being a nominee of the Crown, the others elected for life by the ratepayers—of the rectors of the twelve parishes, of twelve constables and fourteen deputies elected for three years. A Lieutenant-Governor sent from England controls the executive, and has power to join in the deliberations of the States, but has no vote, though he has

the exercise of a veto. The militia, too, consist of every man between seventeen and sixty-five, under his control. The only town of importance is St. Heliers on St. Aubin's Bay, which is the administrative centre. It has an inner and an outer harbour protected by fortifications, and contains, besides the official buildings, a church dating from 1341, Victoria College, and a large Jesuit seminary. On the rocks in front stand Elizabeth Castle, built in the reign of that queen upon the site of an ancient abbey. Montorgueil Castle and St. Brelade's Church (1111) are also structures of much interest. Pop. (1901) 52,769.

Jerusalem (Hebrew YERUSHALAYIM or YERUSHALEM, signifying probably "abode of peace, Greek HIEROSOLYMA late Latin ÆLIA CAPITOLINA), the capital of Judea, and the central point of Hebrew worship and Christian tradition; was founded by the ancient Canaanite inhabitants upon a spur of the limestone ridge that forms the watershed of this part of Syria. Standing at an elevation of 2,600 feet upon a plateau about half a mile square, and cut off by the deep valleys of Gihon W., Hinnon S., and Jehoshaphat E., the city held an almost impregnable position, and was only wrested from the Jebusites by David, who made it the base of his military and political enterprises. The area above indicated included four distinct elevations, now scarcely perceptible, viz., Mount Zion to the extreme S.W., Mount Moriah to the S.E., Acra to the N.W., and Bezetha to the N.E. It is probable that David's city lay between the first two, where now the Jewish quarter exists, his palace being on the slope leading to the pool of Siloam. On Mount Moriah Solomon built his famous temple, where a rectangular walled space called the Haram at present encloses the Mosque of Omar and the El Aksa Mosque, once, perhaps a Christian church. Recent explorers believe that they have found traces of Solomon's masonry here and the foundations of the existing walls are more safely identified with those of the sacred building as reconstructed by Hadrian. A valley with a depth of 100 to 150 feet, called the Tyropœon divided Mount Moriah from Acra, and was spanned by a bridge. On the brow of this latter hill is the striking Byzantine church of the Holy Sepulchre built in the 4th century by the Empress Helena to distinguish the grave in which Christ lay, and to indicate the scene of His crucifixion and resurrection. There can be little doubt that her identification of these sacred spots rests upon no conclusive evidence, but the claims of other localities present difficulties which it is impossible to discuss within the limits of this article. North of the Haram is a huge rocky platform, where the Seraiyak, or residence of the Turkish governor, marks the site of the Antonia Tower, and the Court of Pontius Pilate. Hence across a deep fosse the height of Bezetha is seen, beyond which lay the caves of the kings, and the place of stoning. Though Mount Zion and Jerusalem are used in the Scriptures as bearing the same signification, this hill appears in early times to have merely been the seat of an outlying fortress, nor was it until the Hasmonean dynasty

that the royal residence, afterwards so enlarged and adorned by Herod, was established here. The palace of Solomon, of stone and wood, probably occupied a position somewhat north of that of David, in the space between Mount Moriah and Zion, known as Ophel. Of the more ancient walls and fortifications, little is known for certain. The eastern limit of the Haram enclosure contains traces of early work. At the date of the siege by Titus there were two older bulwarks, one running

and again destroyed by the Greeks to be renewed by Jonathan. Then the siege by Pompey (65 B.C.) caused havoc which was repaired by Antipater, and at the time of Christ the city had attained its extreme dimensions, including the vast structures of Herod on Mount Zion and its flanks, with the suburb of Bezetha to the N.E.; but in spite of the full details given by Josephus, we have no accurate knowledge of the state of the Acra or N.W. height, to which tradition assigns the position of Golgotha.



JERUSALEM, FROM THE MOUNT OF OLIVES.

west from the West Gate of the Temple to the Tower of Hippicus, and a second starting from the north-west corner of the Temple enclosure and ending with a semicircular sweep at a point near the other. A third wall, begun by Agrippa I., embraced the whole districts of Bezetha and Acra in its extensive circuit. Jerusalem, like Rome, was the object of much exaggeration on the part of patriotic chroniclers, but Solomon, without doubt, left the city in a state of some splendour, much of which was swept away by the invasion of Shishak, and later on Jehoash levelled the walls in part. The fall of Samaria brought prosperity to her rival, and in the time of the later kings Jerusalem had extended its suburbs a good way from the Temple hill. Nehemiah, describing the fortifications as restored by himself about 445 B.C., does not clearly define the circumscribed area, but his circumvallation from the Fountain Gate opposite Siloam to the Valley Gate (now Jaffa Gate) on the west most likely followed the valley of the Tyropæon. After the return from the captivity no great increase ensued for some years. Indeed, Ptolemy I. raised the fortifications in 320 B.C., nor were they restored by the high priest Simon until 200 B.C. Thirty years later Antiochus Epiphanes again swept them away, but they were rebuilt by Judas Maccabæus,

The assaults of Titus brought about the final destruction of the Temple, and of the most ancient quarter as far as the Pool of Siloam. Hadrian apparently purposed to restore the Temple and make the city a Jewish capital, but after the revolution he was content with making *Ælia Capitolina* a mere pagan centre. The next important period of revival was on the discovery of the Holy Sepulchre, under Constantine (336), when the magnificent church of the Anastasis was erected. Thirty years later, in Julian's reign, another vain attempt was made to renew the glory of the Temple. Eudocia, who ended her life here, founded the church of St. Stephen, and Justinian that of St. Mary. Chosroes took the city in 614, and in 637 it fell into the hands of the Caliph Omar, who began the Mosque of El Aksa, completed about 691 by Abd-El-Malik, the site having been identified with the spot visited by Mahomet in his miraculous journey from Mecca. Saladin (1192) fortified the place, but the modern walls were the creation of Soliman the Magnificent. They enclose about 210 acres, and are pierced by eight gates corresponding in the main with the older ones. The division of the city into four quarters, Christian, Armenian, Jewish, and Moslem, is not very strictly observed. Churches and monasteries with schools and charitable

institutions are very numerous ; the Greek Orthodox sect predominates over all other Christian settlers, but the Jewish population, yearly increasing, is larger than all the remaining elements put together. Interesting modern establishments are the Rothschild Hospital and the Almshouses founded by Sir Moses Montefiore. Jerusalem is the Turkish capital of Southern Palestine, being included in the Vilayet of Syria. Municipal affairs are conducted by a mixed council under the Governor, and all foreign states are represented by consuls, who exercise considerable power. The climate is fairly good, though liable to extreme changes ; but the water supply, though improved, is far from satisfactory.

Jervis, EARL ST. VINCENT, SIR JOHN, English admiral and the greatest of all naval administrators, was born at Meaford in 1734. At the age of ten he entered the navy, became a lieutenant in 1755, and was made acting captain in 1757. The operations at Quebec won him a commander's commission in 1759, and in 1760 he was posted. In 1784 he was elected M.P. for North Yarmouth, and he became a rear-admiral in 1787, and a vice-admiral in 1793. He thereupon assumed the chief command in the West Indies, where Martinique, St. Lucia, and Guadeloupe were quickly captured. He returned in 1795, and in the same year was made admiral and commander-in-chief in the Mediterranean, where he hoisted his flag, 1796, in the *Victory*. He carried out, with the aid of Nelson, the evacuation of Corsica, assisted the Austrians in the Adriatic, blockaded Leghorn and Genoa, and protected the convoys. But when Spain joined France he was reduced to the necessity of abandoning the Mediterranean, and retired to Lisbon. In 1797 he won a splendid victory which gained him an earldom, a gold chain and medal, and a pension of £3,000 a year. He next blockaded and set Nelson to bombard Cadiz, repressed a serious mutiny in his fleet, and detached Nelson on the mission which ultimately resulted in the victory of the Nile. Lord St. Vincent returned to England in 1799, and in the following year took command of the Channel fleet and was made Lieutenant-General of Marines. But in 1801 he relinquished employment afloat in order to become First Lord of the Admiralty.

Jesse, son of Obed and grandson of Boaz and Ruth, belonged to the tribe of Judah. He had seven sons, the youngest of whom was David, and two daughters, at all events, Zeruah and Abigail.

Jesse, EDWARD, the son of a clergyman, was born at Bewdley, Worcestershire, in 1780. He was fortunate enough to become private secretary to Lord Dartmouth, and thus held a number of public offices until 1830, when he retired on a pension and devoted himself to literature. *Anecdotes of Dogs* (1846) was his first successful book. *Favourite Haunts and Rural Studies* followed in 1847 ; but his most popular works were the annotated editions of Izaak Walton's *Compleat Angler*, and White's *Natural History of Selborne*. He died in 1868.

Jesse, JOHN HENEAGE, son of the above, born 1815, was for many years a Crown official. He

compiled several interesting volumes of semi-historical works in a pleasant gossiping style. Chief among these are *Memoirs of the Court of England during the Reign of the Stuarts*, *Memoirs of the Court of London from 1688 to 1760*, *George Selwyn and his Contemporaries*, *Memoirs of the Pretenders*, and *Richard III*. His death occurred in 1874.

Jest-books is the name given to collections of witty sayings and practical jokes, and to collections of facetiæ gathered from all sources. Of the first class *Tarleton's Jests*, *The witty and entertaining Exploits of George Buchanan*, commonly called the *King's Fool*, *Jests of Scogin*, etc., are specimens ; but very few were authentic or original. A *Hundred Mery Tales* (about 1525) is the oldest English jest-book known, and Taylor's *Wit and Mirth* is one of the few original works. The best known of English collections of facetiæ is *Joe Miller's Jest-book, or the Wit's Vade Mecum* (1739). In the *Stichus* of Plautus the parasite talks of consulting his books of witty sayings, so that jest-books were known in Rome early in the 2nd century B.C., if not in Athens still earlier.

Jesters, COURT, or COURT FOOLS, were persons in the employ of princes and others, who by their real or affected folly furnished amusement for their masters. They were sometimes witty buffoons who were licensed to quiz the courtiers and even their own masters. The first mentioned in English history is William the First's fool, Goles. Amongst other celebrated jesters are Will Somers, the fool of Henry VIII., and Archie Armstrong of Charles I. ; in France, Friboulet of Francis I., and Chicot of Henri III. In the East the most famous was Bahalul, the fool of the Caliph Haroun al Raschid. They wore a motley dress and a hood, and carried a bauble, to which a distended bladder was frequently attached. The priory and hospital of St. Bartholomew were founded by Rahere, jester to Henry I.

Jesuits, the members of the society of Jesus, a most influential religious order founded by Ignatius Loyola, which was established by a bull of Paul III., 1540. The founder projected a society devoted to self-culture in all that made for religion, to preaching, gratuitous teaching, and missionary labour, and, in virtue of a fourth vow peculiar to them, bound to obey the Pope implicitly. The intense enthusiasm of the founder and the striking applicability of his general ideas to the circumstances of the Catholic Church attracted several adherents of exceptional ability, notably Diego Lainez, the second general ; Francis Xavier, the "Apostle of India ;" Spaniards, and Pierre le Fevre, or Peter Faber, of Savoy. The society rapidly became the most powerful agent in the reaction which checked the spread of Protestantism, and in time restored whole provinces and kingdoms to the Romish Church. Their learning enabled them to carry on with better success the contests in which the old forces of the Papacy had been worsted by the Reformers and the humanists, Salmeron and Bellarmine being their chief controversial writers. Their zeal and capacity for education continually

enlarged the sphere and strengthened the foundations of their influence. Their attention to the exigencies of polite society and their sympathy with the spirit of enlightenment and material progress made them popular with all classes, while the completeness of their organisation developed a marvellous display of well-directed effort, the most distant ramifications of their vast system being actuated by one intelligent will, that of the general in Rome, whose decisions were based on reports regularly transmitted from the provincials, the superiors of professed houses, the rectors of colleges, the masters of novitiate houses, and individual members delegated to any special office or service. Thus the general and his assistants commanded a bureau of almost universal information on ecclesiastical, political, and social matters. The general, though the supreme head of the society, was himself controlled by a monitor, and advised by five assistants or counsellors. The grateful popes allowed the Jesuits immunity from regular monastic rules, so that they might the more easily attain the practical ends at which the order aimed. The complete self-surrender of every member gave the general instruments on which he could place absolute reliance. Secular offices, such as that of provincial and the rectorship or management of a college, were at first in the hands of secular coadjutors, who only took the vow of implicit obedience, by which arrangement the order avoided external friction between the religious and the lay sentiment, while the secular and professed members kept a check on each other. In a very few years from its foundation this remarkable society had established colleges in many kingdoms of Europe, and had scattered missions over heathendom literally from China to Peru. Many of their professed members were confessors of sovereigns, statesmen, and nobles, and everywhere they were the indefatigable champions of the supremacy of the Roman See. Aquaviva, general from 1581 to 1615, deserves special mention for his improvements in the training of the young, which made the schools of the Jesuits popular and famous. In a few years the Jesuits established themselves firmly in several states of Italy, throughout Spain and Portugal, where they gained great influence at both courts. Before 1570 they had assured the Papal ascendancy in Austria, Bavaria, and the Tyrol, and had gained ground against Protestantism in Germany and France. Their success as missionaries was most conspicuous in Spanish America, where they converted and civilised vast numbers of Indians. In Paraguay they organised a hierarchical state, wherein an ideal age of innocence and prosperity was enjoyed until, in 1750, the Portuguese minister Pombal obtained possession of a large portion of the country by exchange with Spain, and, war having in consequence broken out, procured the recall of the Jesuits from Paraguay, and in 1759 the expulsion of the order from Portugal. By the time of their centenary, 1640, when Vitelleschi was general, their numbers had increased to over 13,000, and abuses had begun to deteriorate the character of the order, and the downward career was in Ranke's opinion much accelerated by the admission,

under Vitelleschi, of professed members to the secular offices. The Jesuit MOLINA (d. 1600) had held semi-Pelagian views concerning grace. The Jansenists revived the Molinist controversy, 1640, and in 1656 PASCAL in his *Lettres Provinciales* made a violent onslaught on the Jesuits and their system of casuistry, developed by Escobar, Busenbaum, and others, which, according to their opponents, is subversive of the foundations of morality. By the middle of the 17th century the Jesuits' system of instruction had ceased to satisfy the spirit of the age, and was condemned as superficial. Their acquisition of wealth and assiduous engagement in commerce, in defiance of the fundamental principles of the order, raised up hosts of enemies. Owing to the failure of their factory at Martinique, 1743, they were expelled from France in 1763. They were expelled from Spain in 1767, and in 1771 the order was abolished by Clement XIV. It was shrived or reprinted by Pius VII., 1814. The Jesuits now enjoy considerable influence in southern Europe, and have colleges in England, Ireland, the United States, and elsewhere, and missions in many heathen countries. [LA CHAISE, MALAGRIDA, MARIANA, VICENTINES.]

Jesus Christ (Gk. *Iesous Christos*, the first word being a transliteration of the Hebrew Jehoshua, Jeshua, or Joshua, "Jehovah is salvation," the second with the signification "anointed" expressing the sense of the Hebrew Messiah) was born at Bethlehem, a town of Judæa, towards the end of the reign of Herod the Great. The authorities for the facts of his life are almost entirely biblical, and as in this work criticism would be out of place, a brief summary is here given of these authorities. The date of the event cannot be absolutely fixed, but the best authorities place it early in the 4th year before the commonly accepted Christian Era. Of the annunciation and the conception the only record is preserved in Matthew's Gospel. Warned, according to the biblical narrative, by an angel of the massacre into which Herod's jealous fear was driving him, Joseph, taking Mary and the babe, fled into Egypt, where their stay must have been brief. On their return after Herod's death, they settled with a view to concealment at Nazareth, a distant and despised town of Galilee, of which, however, Joseph and Mary were natives. Here Jesus apparently was brought up to his father's trade of carpenter, "was subject to his parents," and "advanced in wisdom and stature, and in favour with God and man." At the age of twelve he was taken by his parents for the first time to Jerusalem, where occurred the discussion with the doctors in the Temple. For the next eighteen years Christ's career is to us a blank. Luke distinctly states (iii. 23) that Christ's age at the time of his baptism by John the Baptist was thirty, and authorities are generally agreed that his ministry lasted for three years at least, covering three, if not four, passovers. The crucifixion would thus coincide with the Paschal Feast of A.D. 30, and the testimony of John the Baptist must have been given early in the year 27. There is some difficulty, no doubt, in arranging the incidents of the intervening period in strict chrono-

logical succession, but the following may be accepted as a near approach to accuracy:—

First Year. The temptation in the wilderness, lasting forty days, was succeeded by a second visit to Jordan, when John repeated his witness in the hearing of Andrew and John, who forthwith attached themselves to Jesus as his disciples, and were joined soon after by Simon, Andrew's brother—named Cephas or Peter by his new master—Philip, Nathaniel, and others. The little group set off into Galilee, and halted at Cana for the celebration of a marriage-feast, at which the first miracle was performed, Mary being also present. After a brief stay at Capernaum, they journeyed to Jerusalem to keep the Passover, where occurred the cleansing of the Temple and the interview with Nicodemus.

Second Year. Jesus for a third time visited the north-eastern part of Judæa where the Baptist was still preaching, and again received from him full acknowledgment. Within a few weeks John was cast into prison by Herod, and Jesus was on his way through Samaria to Galilee. In the course of this passage occurred the meeting with the Samaritan woman at the well of Jacob, and during a visit to Cana the son of the nobleman at Capernaum was healed from a distance. Christ went up to Jerusalem this year for the feast of Purim, the cure of the paralytic man at the Pool of Bethesda on the Sabbath provoking the resentment of the Pharisees. We next hear of his appearance as an expounder of Isaiah in the synagogue at Nazareth, whence he was driven by the threats of the Jews to fly to Capernaum. Here at his bidding Simon made the miraculous draught of fishes, James and John were added to the list of disciples, a devil was cast out in the synagogue, and Simon's mother-in-law was cured of a fever. In a progress through Galilee Christ cleansed a leper by the touch of his hand, restored the paralytic sufferer, and called Matthew, the tax-gatherer. We now first hear of definite schemes against his life on the part of the Jewish bigots. The next event is the choice and appointment of the twelve apostles, and the sermon on the mount. At its conclusion Christ moved to Capernaum, healing there the centurion's servant, and going on to Nain, where the widow's son was brought to life. Next occurs the episode of the anointing at the house of Simon the Pharisee by the penitent woman. The cure of a deaf and dumb demoniac stimulated the enemies of truth to accuse Jesus of complicity with Beelzebub; and they were severely rebuked. A long series of parables preceded the stormy night voyage across the lake. On the further side, in the country of the Gadarenes, Christ fell in with the man possessed of many devils, who were at their own prayer allowed to enter into and destroy a herd of swine. The party recrossed the lake, and amongst those awaiting their return was the woman with an issue of blood, and Jairus, whose daughter was at the point of death. The tidings of the murder of the Baptist now induced Jesus to move to Bethsaida, where the second Passover was observed amongst his disciples.

Third Year. Almost synchronous with the great festival was the miracle of feeding the five thousand. During the night following, a storm

arose, in the midst of which Christ appeared walking upon the waters. Once more in Capernaum he foreshadowed to his disciples the mystery of the Eucharist. He passed thence to the neighbourhood of Tyre and Sidon, seeking seclusion, but was pursued by a Syrophenician woman with earnest entreaties for her daughter's welfare, and her prayer was answered. In the region of Decapolis a deaf and dumb sufferer was healed, and this attracted numbers of afflicted persons, for whose benefit the feeding of the four thousand ensued. The scene is soon after changed to the opposite coast of Magdala, where the Sadducees sought a sign and received a rebuff. Crossing the lake once more to Bethsaida, Christ restored sight to a blind man by anointing his eyes with clay, and then journeyed to the confines of Cæsarea Philippi. The transfiguration followed. After this we hear of the expulsion of the evil spirit from the lunatic child, on whom the apostles had tried their powers in vain. Capernaum being revisited, Jesus spoke more freely of his approaching death and resurrection, and Peter by his orders took from the lake a fish which held in its mouth money to pay the tax for the Temple. Jesus was then urged by his unbelieving brethren to go up to Jerusalem, and there give proof at the Feast of Tabernacles of his supernatural claims. Though his "hour was not yet come," he set out for the holy city. Christ now openly taught in the Temple, and his discourse on the living water so incensed the Sanhedrim that they resolved on laying hands on him, and this resolve was strengthened by the pardon given to the woman taken in adultery, and by the restoration to sight and the conversion of a man blind from his birth. Jesus, however, retired for a time to some unknown place in Judæa, whence he sent out seventy disciples, two and two, as messengers of the Word. At the Feast of Dedication he was once more in the Temple, and was threatened with stoning, so that he was again constrained to take refuge near Bethany. The grief of Martha and Mary at the death of their brother Lazarus summoned him to Bethany, where the miracle of raising the dead was again performed. The news of this event inspired Caiaphas and the Sanhedrim with the determination to take his life, their designs being for the moment frustrated by his departure to Ephraim. Whilst wandering thence towards Peræa, he fell in with ten lepers, all of whom were made whole. The Passover was now approaching, and Jesus, knowing that his hour was near, set out for the last time to Jerusalem by way of Jericho, healing two blind men on the road. Bethany was reached six days before the feast, and as he sat at meat in the house of Simon the leper, Mary anointed him with spikenard. Christ began now his triumphal entry into Jerusalem, seated in fulfilment of prophecy upon an ass, which two of his disciples by his order had procured at Bethphage. He returned at night to Bethany, and on the following morning again went to the Temple, cursing the barren fig tree by the way. Then occurred the second cleansing of the Temple, where he taught and ministered to the people, spending that night as the previous one at Bethany. The Temple was once more visited on

the morrow, and in the court of women he saw the poor widow bringing her mites to the treasury. On quitting the Temple he prophesied its speedy destruction. Meanwhile the priests and rulers, seeking some means to compass his death, were approached by Judas Iscariot, who covenanted to betray his master for thirty pieces of silver. The time for the celebration of the Passover being now close at hand, Christ sent Peter and John to find and prepare the guest-chamber, himself following from Bethany in the evening, when took place the Last Supper. The meal over, they all went forth to the Mount of Olives as though to return to Bethany. On reaching the Garden of Gethsemane, Christ entered it with Peter, James, and John only. Judas coming into the garden with soldiers, pointed out his master by a kiss. Jesus surrendered himself to his enemies, and when Peter smote off the ear of Malchus with a sword, restored it at once. He was led by his captors before Annas, and whilst he underwent questionings and buffetings, Peter, standing outside among the servants, thrice denied Christ. Jesus was then brought before the Sanhedrim. The court pronounced him guilty of death, and remitted him to Pilate, who alone could give effect to the sentence. Then ensued two interviews with Pilate, first in the public prætorium, afterwards in a private chamber, after which the governor decided to submit the matter to Herod Antipas, who sent him back to Pilate. The latter would gladly have released him, convinced as he was of his innocence, and warned by his wife's dream, but the Jews clamoured for the extreme penalty, and preferred to see mercy extended to Barabbas rather than to Christ. Pilate caused Jesus to be scourged, crowned with thorns, arrayed in a purple robe, and adorned with a reed as a sceptre. The Jews, however, overcame the procurator's final scruples by casting a suspicion on his loyalty to Cæsar. So the judgment was passed, and he was led forth to Golgotha bearing his cross, until Simon of Cyrene was forced to assist him. He was nailed to the cross, a malefactor on either side of him, and the inscription, "This is Jesus the Nazarene, the King of the Jews," fixed above his head. Mary, his mother, stood near with her sister, Mary Magdalene, and the apostle John also stood near and heard his last words. With Pilate's sanction the body of Christ was given to Joseph of Arimathæa, who, aided by Nicodemus, conveyed it that same night to a rock sepulchre hard by. Early next morning the women returned to complete the embalming, and an angel rolling away the stone for them, they found the tomb empty. Peter and John were summoned, and verified the report of the women. Christ's first appearance was to Mary Magdalene a few hours later, and then he was seen by other women. Towards evening he spoke to Cleopas and another disciple on the road to Emmaus, and entered their dwelling. After that he revealed himself to Simon, to the ten when he ate in their presence, to the eleven when the doubts of Thomas were dissipated. Some time later he manifested himself to seven of the apostles, who had now gone back to their fishing on the Sea of Galilee. Again upon a mountain in Galilee he became visible to many, and finally, just before

Pentecost, he joined the company of believers then going up to Jerusalem, and led them to a hill near Bethany, where he "vanished out of their sight."

Jet, a compact lustrous variety of lignite (q.v.) resembling cannel coal, but harder and taking a better polish. It is undoubtedly of organic origin, being generally, if not always, derived from coniferous wood. It burns with a thick smoke. It occurs in isolated masses in the bituminous shales in the zone of *Ammonites serpentinus*, near the base of the Upper Lias at Whitby in Yorkshire, where it was worked by the Romans, and seemingly even in the Bronze age. Its lightness renders it valuable for ornaments, and the tough Whitby jet can be readily carved. Jet is imitated by black glass and by ebonite.

Jetsam (JETSON or JETTISON). By this designation, goods which have been cast into the sea and there sink and remain under water, are distinguished. For the distinction between this and flotsam, see FLOTSAM.

Jevons, WILLIAM STANLEY, F.R.S., the son of a Liverpool merchant and grandson of William Roscoe, was born in 1835, and educated at University College, London. From 1854 to 1859 he was assayer to the Mint at Sydney, and produced a book on the climate of Australia and New Zealand. On returning to England he took up economical science and logic, holding professorships in Owens College, Manchester, from 1866 to 1876, when he was appointed to the chair of political economy in University College, London. As a writer he first drew attention by *The Coal Question*, wherein he predicted the speedy exhaustion of our supply of fuel. His chief other books are entitled *The Principles of Science*, *The Theory of Political Economy*, *Elementary Lessons in Logic*, and *Money and the Mechanism of Exchange*. He was drowned whilst bathing at Bexhill in 1882.

Jewel (or JEWELL), JOHN, Bishop of Salisbury, was born near Ilfracombe, N. Devon, in 1522. He entered Merton College, Oxford, at the age of thirteen, and four years later became tutor at Corpus Christi. Having early embraced Protestant principles, he was expelled under Mary in 1553, when he made a weak recantation, which he afterwards abjured on effecting his escape to Frankfort. Coming home again on the accession of Elizabeth, he was made bishop in 1560, the date of the publication of his famous *Apologia Ecclesiæ Anglicanæ*, a claim on behalf of the Reformed Churches to take part in the Council of Trent. The Queen ordered a copy of the book to be chained beside the Bible in every parish church of England. In 1567 he published his *Defence of the Apology* in reply to Thomas Harding. Jewel boldly assumes the position that the Church of England is based not upon the fathers and tradition, but upon the teaching of Christ and the gospels. He scouted the doctrines attributing supernatural efficacy to the sacraments, and maintained that a consensus of opinion was not a test of truth. He died suddenly at Monkton Farleigh, Wilts, in 1571.

Jewellery, the name given to articles made of precious stones and metals for personal adornment, and to other jewelled specimens of gold- and silver-smiths' work. There are many different kinds, from the beads of early times and of savages to richly-chased ornaments of precious stones cut and set in wrought gold. The earliest worked metal in use was gold, which was hammered into shape. Precious stones used in jewellery include diamonds and gems, such as rubies, sapphires, and cameos of various kinds, and also pearls, jet, and coral. Among the first to master the art of making jewellery were the Egyptians, and in the oldest monuments we find engraved examples enriched with enamel as well as stones, and with the different parts soldered together. The Greeks, Etruscans, and Romans have left us specimens of their work. Now most jewellery is made by machinery. The places where jewellery is chiefly made are London (Clerkenwell), Vienna, Paris, New York, Birmingham (where sham jewellery is made), and Whitby (where jet ornaments are made). In the East the precious stones used are generally uncut. "Prussian jewellery" is of delicate work, made of iron, originally made during the French occupation.

Jews (Mediæval French *Juis*, from Lat. *Judæi*), properly the descendants of יְהוּדָה, Yehûdah, Judah, fourth son of Jacob, but applied generally to the Hebrew people, who since the dispersion of the ten northern tribes have been mainly represented by the tribe of Judah, a remnant of Benjamin and a few Levites—that is, the section of the nation which to the number of some 50,000 returned to South Palestine (Judæa) after the Babylonian captivity. These were doubtless, later, joined by some of the dispersed northern tribes, from remote times distinguished as the "ten tribes of Israel" from Jacob's alternative name; but all such Israelites had lost their separate nationality, and were consequently absorbed in the royal tribe of Judah. Since the destruction of Jerusalem by Titus (A.D. 70), and the suppression of the two last revolts—that of the Cyrenaica Jews by Trajan (115–17), and that of the Palestine Jews under Barcokeba by Adrian (132–35)—the Judæi themselves have been a dispersed nationality, though numerous migrations and settlements had been made in various parts of the Greek and Roman worlds, in Arabia and Abyssinia, centuries before those events. The flourishing Jewish community of Alexandria was established under the first Ptolemy, and from that great centre large colonies had moved westwards to Cyrenaica and Tripolitana, some of whose descendants (the Troglodyte Jews of the limestone cliffs south of Tripoli) survive to the present day. But the great bulk of the scattered people descend from those of the great dispersion after the fall of Jerusalem, increased by numerous accessions from converted "Gentiles," for the assumption that they have made few or no converts is based on ignorance. In exile they have been far more a religious sect than a broken nation, and as such they could not fail under favourable conditions to spread their teachings, not only amongst their Christian slaves, but also amongst peoples of lower culture than themselves.

Apart from the Abyssinian Falashas [**FALASHAS**], in pre-Mohammedan times many Arab tribes of Yemen and other districts had conformed, and some of their Jewish kings (Asad Abu-Karib, Dhu Nowas, etc.) are still remembered. About the 7th century all the Khazars, a renowned Tatar people of the Volga, the Crimea, and the Caspian, accepted Judaism, though these were afterwards absorbed by the Russian Christians. The terrible persecution of the Spanish Jews under the Visigoth kings (5th and 6th centuries) appears to have been largely due to their proselytising zeal, against which, as well as against Jewish and Christian mixed marriages, numerous decrees of popes and councils were issued during mediæval times. To this process of miscegenation is attributed the great variety of physical features observed amongst the Jews of different countries, while the distinctly red type cropping up almost everywhere has been traced by Sayce and others to primordial interminglings with the Amorites ("Red People"). Dr. Dally, a distinguished French anthropologist, declares that there are all kinds of Jews—brown, white, dark; Jews with black and with blue eyes; tall, short; concluding that, therefore, there is no longer any question of a Jewish race at all. Nevertheless, certain marked characteristics, such as large hooked nose, prominent watery eyes, thick and almost everted under lip, rough, frizzly, lustreless hair, flat feet, are sufficiently general to be regarded as racial traits. According to the "Jewish Year-Book" the Jewish race, or at least the Jewish sect, numbers at present about 11,000,000, of whom 8,760,000 are in Europe, 377,000 in Asia, 392,000 in Africa, 1,500,000 in the Americas, and 17,000 in Australasia. In 1907 they were estimated at 220,000 in the British Isles, of whom over 140,000 are in London alone. The race is richly endowed with the most varied qualities, as shown by the whole tenour of their history. Originally pure nomads, they became excellent agriculturists after the settlement of the Promised Land, and since then they have given abundant proof of the highest capacity for poetry, literature, science, erudition of all kinds, music, and diplomacy. The reputation of the mediæval Arabs as restorers of learning is largely due to their wise tolerance of the enlightened Jewish communities in their midst, and on the other hand Spain and Portugal have never recovered from the national loss sustained by the expulsion of the Jews from the Iberian Peninsula in the 14th and 15th centuries.

Jew's-ear, the popular name of a tough gelatinous fungus, *Exidia Auricula-Judæ*, belonging to the Tremellini. It grows principally on the elder, one of the trees on which Judas is said to have hanged himself, and occasionally on elm. It is cup- or ear-shaped, velvety externally and wrinkled within.

Jew's-harp, or **JEW'S TRUMP**, one of the simplest of musical instruments. It consists of a steel tongue between two parallel bars, to which it is fastened at one end; at the other is a piece at right angles, so that it can easily be struck with the performer's finger. Various sounds can be produced

by the performer altering the shape of the resonator furnished by his mouth and throat. The most celebrated performer was a man named Eulenstein, who played on sixteen Jew's-harps tuned to different keys. He performed in London in 1828, and died 1890.

Jeypore, or JAIPUR, the name of a state and its capital in Rajputana, N.W. India. The former has an area of 14,465 square miles, lying N. of Gwalior and S. of Patiala, having Alwar to the E. and Jodhpur to the W. It consists of an open and tolerably level tract sloping upwards from the Jumna towards the Aravalli range in the N.W., where it forms a triangular plateau and extends into the sandy desert of Shaikhawati. Here vegetation is scanty, but the S.E. districts bear fine crops of cereals, pulses, cotton, sugar, seeds, opium, and tobacco. Irrigation has done much to improve agriculture in the last quarter of a century. Copper and cobalt are found in the mountains, and the Sambhar Lake yields a large supply of salt. The climate is dry and healthy. The government of the state is in the hands of a Maharajah, whose policy is guided by a British resident. The capital is one of the finest and richest of Hindu cities, and stands on the Rajputana State Railway, which runs from Agra to Nasirabad. Founded in 1728, Jeypore occupies a plain defended on all sides except the S. by rugged hills. It has a length of 2 miles, by a breadth of $1\frac{1}{4}$ miles, and the streets are handsomely laid out and lighted with gas. Banking and exchange business constitute the chief sources of prosperity. Among the principal buildings are the Palace, the Residency, the Thakur's College, the Observatory, and many fine mosques and temples.

Jhansi, the name of a division, a district, and city in the north-western provinces of British India. The division has an area of about 5,000 square miles, comprising the greater part of Bundelkhand, and including the three districts of Jalaun, Lalitpur, and Jhansi. The latter, lying between the other two, extends over 1,567 square miles of sloping ground from the Vindhya range on the S. to the Jumna on the N. The upper portion is mountainous and rocky until the rich alluvial plain of Bundelkhand is reached. The Pahuj, Betwa, and Dhasan are the chief rivers. Much of the land is sterile, and much uncultivated; droughts and floods occur frequently; the population is poor and sickly; though the more fertile parts yield in good years plenty of cotton, pulse, cereals, and *al* root for dyeing. The district was not entirely annexed by the British until 1853, and the deposed *rani* proved a troublesome foe during the Mutiny of 1857. She was killed in battle, and under our rule the prosperity of the country has advanced. The city of Jhansi is in the neighbouring state of Gwalior, to which it was transferred with a strip of territory in 1861. It possesses a stone fort built on a lofty rock, and commanding the neighbourhood as well as the new settlement of Jhansi Naoabad, where the headquarters of the Jhansi district are now established.

Jhelum, or JHILAM, a district in the Punjab, British India, lying between Rawal Pindi N., the

Jhelum River E., and the districts of Shahpur and Bannu S. and W. Consisting of 3,910 square miles, mostly taken up by the three ridges of the Salt Range, which trend down from the Himalayas, Jhelum is picturesque but by no means fertile, except along the banks of the river and in the occasional valleys. Here wheat and *bajra* are grown, but the most valuable product is salt. The population is chiefly Mohammedan, and a dynasty of semi-independent princes, established after the Moghul invasion, ruled here until conquered by Rangit Singh, from whom the whole country passed into British hands. Though Jhelum, a small modern town on the river of that name, is the administrative centre, nearly all the trade is carried on at Pind Dadan Khan.

Jib, the foremost ordinary sail of a ship, barque, brig, schooner, or cutter; a large staysail extended from the bowsprit, or bowsprit and jib-boom, towards the foretopmast head, or, in cutters, etc., towards the lower masthead. It is of great command in a sidewind, and especially when the vessel is close-hauled. A flying-jib is a sail occasionally set upon a boom rigged out beyond the jib-boom. A middle-jib is sometimes set between the two already mentioned.

Jiddah, JEDDAH, or DJIDDAH, a town and port of Arabia on the E. coast of the Red Sea, about half-way between Suez and Aden. As the spot at which pilgrims journeying to Mecca by sea have to begin their inland march, it is a busy and prosperous place, spreading, with its white houses, for a mile or more along the beach, and containing a good bazaar, several indifferent mosques, and a network of narrow streets enclosed within a dilapidated wall. The Mecca gate to the E. is surrounded by a large suburb and market. Outside the Medina gate on the N. stands the tomb of Eve and the quarters of the Turkish garrison. The sanitary condition of the town, once appalling, has been somewhat improved of late, but the scarcity of water is a great defect. Jiddah, in the 15th century, was the point at which the traders from the East and the West used to meet, but with the improvement of navigation and the introduction of steam, this state of things passed away. There is, however, still a considerable export of Arab produce—coffee, gums, mother-of-pearl, hides, and embroidered tissues; whilst the merchants of the interior draw their supplies of Western goods from the bazaars. Turkish rule has prevailed continuously, except during the brief career of Mehemet Ali. In 1858 a massacre of the European residents led to the bombardment of the town by an English man-of-war. The distance from Mecca is about 45 miles, and that from Medina about 200 miles.

Jigger, a small flea, common in the West Indies and South America; the female burrows into the skin of animals, including man, and there lays its eggs. The insect itself swells very largely by the growth of the eggs.

Jingo, in the slang phrases "by Jingo," and "by the living Jingo," is supposed by some to be a corrupt form of the Basque word *Jainko* for *Jangoikoa*,

"the supreme Lord," said to have come to England *via* Wales, whither Edward I. had sent some Basque soldiers. The earliest registered instance of the word occurs in Oldham's *Satyrs upon the Jesuits* (1679). Another explanation is that it is a form of St. Gungulphus. In British politics a "Jingo" was originally an advocate for war with Russia during the Disraeli administration of 1874-1880, the term being taken from a "by Jingo" in a music-hall song, 1878. Now "Jingoism" is British Chauvinism, or an aggressive menacing policy as to foreign affairs.

Jingoism. [JINGO.]

Jinn (the plural of the Arabic *jinn*), in Mohammedan theology, angels created 2,000 years before Adam, but cast out of Paradise because they sinned. Their chief was Iblis (q.v.).

Jintias (*Jaiantias*), a wild tribe of north-east India, akin to the Khassias, occupy the eastern section of the uplands separating the Brahmaputra from its great affluent, the Megna. Since the deposition of their chief in 1835, their territory has formed an integral part of the British province of Assam. The Jintias are a brave but peaceful people, who cultivate much land, and keep large herds of cattle.

Joachim, JOSEPH, was born of Jewish parents at Kitsu, near Presburg, Hungary, in 1831. Entering the Musical Conservatory at Vienna as a mere child, he attained such skill as a violinist that he was engaged at the age of twelve in the Gewandhaus Orchestra, Leipzig. Here he remained for seven years studying under F. David and M. Hauptmann. In 1850 he made his first appearance in Paris, and was soon afterwards appointed director of concerts at Weimar, going thence as Kapell-Meister to Hanover in 1853. By this time his reputation had spread over Europe, and he won especial popularity in London, where he appeared almost annually for about forty years. He never allowed his pre-eminent manual control over his instrument to turn him aside from the highest functions of his art as interpreter of the works of great composers. He himself was a theoretical musician of considerable merit, and has written some excellent concerted pieces in the manner of Schumann. Herr Joachim was, in 1869, called to Berlin as director of instrumental music in the newly-founded Conservatory, and in 1882 was promoted to the directorship of the Berlin Academy of Music. He received, in 1877, the honorary degree of Mus. Doc. from the University of Cambridge. He died in 1907.

Joan, a lady of doubtful historical authenticity who, according to mediæval legends, filled the Papal chair as John VII. or VIII., between the pontificates of Leo IV. and Benedict III. She is said to have been of English race, though born in Germany, her Christian name being either Agnes or Gilberta. Love for a Benedictine monk led her to adopt male attire, and join him in the monastery of Fulda. On his death she kept up the disguise, went to Rome, and by her piety and learning so influenced the Cardinals as to secure the tiara by their unanimous vote. Her secret, however, was not so strictly kept

but that she gave birth to a child in a street near the Lateran Palace, which is to this day avoided by Papal processions. The story first crops up in the Chronicle of Stephen de Bourbon, early in the 13th century. Then it was interpolated into the text of Martinus Polus fifty years later, and so became current, until in 1400 a bust of this chimerical personage was placed among those of the other popes in Siena Cathedral. The fiction probably originated in the spite of the Dominicans and Minorites against the Benedictines.

Joan, known as "the Fair Maid of Kent," was the daughter of Edmund, Earl of Kent, brother of Edward II. She married, as the widow of Sir Thomas Holland, her cousin the Black Prince, and bore him a son, afterwards Richard II. She died in 1385.

Joan of Arc, JEANNE D'ARC, or JOANNETA D'ARC, the Maid of Orleans (Fr. *La Pucelle d'Orléans*), was born about 1411 at Domrémy on the frontier of Lorraine, her father being a small yeoman or peasant proprietor. From her mother, Isabeau, a pious woman who had made her pilgrimage to Rome, she learned the elements of religion and the duties of the house, becoming very expert with the needle, but she could neither read nor write. Overflowing with animal spirits as a child, she grew more reserved and exalted in early womanhood, spending her time in solitude and prayer, repelling the advances of suitors, but not neglecting her duties to her parents and neighbours. In 1428 the Earl of Shrewsbury on behalf of Henry V., whose claim to the French crown was supported by his mother-in-law, Isabella, to the detriment of her own son, Charles the Dauphin, began the siege of Orleans, the capture of which town was necessary before the English could extend their conquests into the south. This event gave an impulse to the girl's highly-wrought and enthusiastic nature. Legends were already current that the wrong done to France by one woman should be effaced by another, and she aspired to become the instrument of heaven for delivering her country. Soon she fancied she heard saintly voices urging her to her task, and no longer deterred by the remonstrances of her kinsfolk, she persuaded the Governor of Vaucouleurs to send her in February, 1429, to the Dauphin's quarters at Chinon. Recognising the prince at once among a crowd of courtiers, she speedily won his confidence, and she was allowed to take five thousand men to the relief of Orleans. Clad in armour, girt with a miraculously-found sword, bearing her holy banner, she rode at the head of the troops, whom her presence inspired with wild enthusiasm. At the end of April she succeeded in penetrating into the city, and ten days later the siege was raised. A series of victories followed, and on July 17th she stood beside the king at his coronation in the cathedral at Rheims. She then urged the feeble-spirited Charles to attempt the recapture of Paris, but the failure of the first onslaught, in which she was wounded, caused him to abandon the expedition, and Joan went off in 1430 to help the Duc d'Alençon. On May 24th, whilst leading a sortie from Compiègne, she was sur-

rounded and captured by the Burgundians. The king made no effort to ransom her, and the Church did all in its power to destroy her. The Bishop of Beauvais procured her sale to the English, who handed her over for trial to the Inquisition. This mockery of justice began on January 9th, 1431, when, being found guilty of heresy and sorcery, she submitted and received a nominal pardon. The English, however, did not release her, but induced her to resume her male attire. She was then charged with repeating her offence, and condemned to death at the stake. She perished with great fortitude in the market-place at Rouen, May 30, 1431. The Church of Rome revoked the sentence twenty-five years later. Her beatification was proposed in 1894, and the canonisation completed at Rome April 18th, 1909. No character has been more acrimoniously discussed than hers, but it has withstood the unclean sneers of Voltaire, and the almost as offensive attempts to make her life and death a source of gratification to her destroyers.

Joannes, or **JUANES, VINCENTE**, was born at Valencia, Spain, in 1523 (or 1506). He studied painting in Rome, and may be regarded as the founder of the Valencian School. His works, chiefly religious, adorn the churches of his native town, and several fine examples exist in the galleries of the Madrid Museum. He died in 1579.

Joannes Damascenus, or **CHRYSONOAS**, was born at Damascus, about 676, of a distinguished Christian family, and received his education from the Italian monk, Cosmas. He incurred the wrath of Leo III. of Byzantium by vigorously defending image-worship, and is said to have had his right hand struck off through the machinations of his foe. The Virgin, however, restored the lost member, and he spent the rest of his days in the monastery of St. Sabas, near Jerusalem, where he composed his *Fons Scientiæ, Vita Barlaam et Josephi*, and his famous hymns, dying at the age of seventy.

Job, the name of the hero of that remarkable literary monument which is preserved in the Hebrew Scriptures under the title of The Book of Job. It is possible that Job may really have existed in the patriarchal age, and that some tradition of his career may have supplied the theme for what is undoubtedly, as we have it, a moral romance and not a historical narrative. As to the value, however, of the few facts recorded, we are less able to form an opinion than upon the exploits of Achilles or Romulus. Nor are we in a much better position to judge as to the authorship of the work or the date of its composition. References that seem to bear upon the Psalms indicate a later origin than the period of Solomon, but in other portions the absence of the name Jehovah or of any suggestion of Mosaic law can hardly be the result of artificial skill. On the other hand, there is a direct mention of Job in Ezekiel, and distinct literary evidence is supplied in Isaiah and Jeremiah. The tone of thought pervading the whole, and the tendency of Hebrew moralists to convey a national as well as a personal lesson in their deliverances, would almost justify

the theory that the Book of Job was cast into its present shape during the period of the Babylonian Captivity. It is probable that the author incorporated with his book pre-existent materials, and it appears certain that interpolations have been introduced at later periods. The work falls naturally into five sections. 1. The prose introduction wherein the author states the facts that lead up to the ethical problem to be solved. (Chaps. i. and ii.) 2. The poetical debate between Job and his three friends is then begun, the famous verses in which he curses his day supplying the keynote. Thrice Job speaks, and on each occasion the comforters reply in turn, except that in the last encounter Zophar remains silent. (Chap. iii.-xxxi.) The main subject discussed is one which is still puzzling mankind, viz., how can we reconcile with the conception of a Divine Providence the fact that the righteous often suffer and the wicked frequently prosper? The Jews, as represented by Job's three visitors, got rid of this awkward difficulty by asserting boldly that all mundane misfortune was a punishment for personal or hereditary sin, and this theory Job passionately confutes. 3. Elihu, the Buzite, who had thus far been a listener only, now comes forward, and reproves all the previous speakers for presuming to set up their judgments against God or to criticise His government of the universe. (Chap. xxxii.-xxxvii.) Whatever He does must be right and good. There is some reason to believe that this argument, which differs little from the speech of God Himself in the following chapters, has been thrust into the poem by a pious imitator. 4. Provoked by Job's challenge, the Deity speaks at last out of the whirlwind, and in more vigorous language than Elihu repeats the crushing doctrine that no being who does not possess God's wisdom and power can presume to cavil at His government. (Chap. xxxviii.-xlii. 6.) Job, abashed, answers: "I have heard of Thee by the hearing of the ear, but now mine eye seeth Thee. Wherefore I abhor myself, and repent in dust and ashes." The problem remains unsolved, but we lose all sense of its importance in the greater mysteries that surround us. 5. The author once more resumes the prose style to mar somewhat the effect of what has gone before by recounting how Job was restored to a prosperity twice as great as that he had enjoyed before, whilst the three friends received a severe rebuke. None of the inspired writings contains grander imagery or appeals more strongly to human sympathies than this product of an unknown mind and an unknown age. It represents, too, that revolt against narrow Semitism which was destined to triumph under the banner of the Cross.

Job's-tears, the fruits of an East Indian grass, *Coix lachryma*, in which the involucre enclosing the female flower and base of the male spike becomes a polished, pearl-grey, oval, stony body, which is often used in rosaries and necklaces.

Jocelin de Brakelonde, the compiler of the well-known chronicle that bears his name, was a Benedictine monk at the Abbey of Bury St. Edmunds, acting as chaplain to Abbot Sampson.

His record of the affairs of the community extends from 1173 to 1202, and is a curious example of the *naïf* and simple spirit of his age. It suggested to Carlyle the idea upon which he founded the essay entitled *Past and Present*. Jocelin died about 1211.

Jodhpur, known also as Marwar, is a native state of Rajputana, India, lying between Bikaner on the N., Jeypore on the N. and E., the Sirohi and Palanpur States on the S., and the Runn of Kutch and Sind on the W. It has an area of 37,000 square miles, most of which consists of a sandy plain dotted with conical hills that occasionally reach the height of 3,000 feet. The river Luni, rising in the Lake of Pushkar and disappearing in the swamps of Kutch, together with its tributaries, waters part of the soil and allows of the growth of fair crops, but trade is the chief resource of the population, and Marwaris are to be found in business over all India. Over 80 per cent. of the inhabitants are Hindus. Salt derived from the lake of Sambhar, and zinc and marble, which abound in the mountains, yield a considerable revenue. Education prevails more widely than in most native states. The Maharaja, a Rajput, has been since 1839 under the surveillance of the Agent-General for Rajputana, and pays a tribute to the British Government, maintaining also the Erinpura Contingent in addition to his own army of about 10,000 men. Jodhpur, the capital, is built about a rock fort which comprises the palace, a fine structure. Stone being abundant, all the streets present a substantial and handsome appearance, whilst a wall 6 miles in length encloses the whole city. Mandor, the ancient capital, now in ruins, lies 3 miles to the north.

Joel, whose name comes second amongst the minor prophets, is called the son of Pethuel or Bethuel, but neither the contents of his book nor the traditions of the Hebrews throw any light upon the author, whose date even is a matter of uncertainty. Some assign him to the reign of Joash in Judah, others contend that he wrote after the return from Captivity. The plague of locusts which forms the starting-point of his prophecies cannot be identified with any historical event, and may be a mere allegory. He does not refer to any specific power as the oppressor of his country, and his mention of Phœnicians, Philistines, Edomites, and Egyptians does not point to any particular period. On the other hand, it would seem that when he wrote the national life still centred about Zion, where elders and priests assembled without a king, that Israel had ceased to exist, and that the walls of Jerusalem had been rebuilt by Nehemiah. Moreover, if the words, "when I shall bring again the captivity of Judah and Jerusalem," are to be accepted literally, they absolutely fix the date as being after the exile. His book opens with an address to the nation then suffering under a plague of locusts, and an invitation to seek the sole remedy in repentance, fasting, and prayer. Then comes the reply of Jehovah to His humbled worshippers, wherein are recapitulated all the promises of future prosperity and of revenge on foreign foes that may be read in the other prophets.

Johannisburg, a town in the province of E. Prussia, Germany, 68 miles S.W. of Gumbinnen. It is close to Lake Rosch or Warschau, and is the capital of a circle, having the usual public offices.

Johannisburg, or JOHANNESBURG, the chief commercial town of the Transvaal Colony, S. Africa, was founded in 1887, its name being derived from a native chief whose subjection involved some trouble. It is situated a few miles S. of the capital, Pretoria, in a barren and dusty plain, but owing to the proximity of the gold-fields and the energy of British immigrants, the development of the place has been marvellously rapid. The population at the census of 1904 was 155,642 more than half of whom were whites. It was partly owing to the difficulties with these immigrants [OUTLANDERS] that the war (commenced Oct., 1899) with the Transvaal broke out, and Johannisburg was at once deserted by the alien population; it was the scene of fighting on one or two occasions, and it was more than a year before the refugees were permitted to return, and more than two years before all the mines resumed work. The streets are well laid out, the buildings handsome, and the sanitary arrangements and comforts of life fairly good, considering the scarcity of water and the great distance over which everything has to be brought by traction.

John, St., Apostle and Evangelist, the son of Zebedee and Salome, was following his father's occupation as a fisherman, when the fame of John the Baptist attracted him to Bethany, where he met Jesus. He became known as "the disciple whom Jesus loved." After the Resurrection he remained in Jerusalem, and was there at the time of Paul's second visit. Tradition asserts that he was settled at Ephesus up to the time of Trajan, and having been immersed with impunity in boiling oil was banished to Patmos, where he wrote the Apocalypse, and died at a very great age from natural causes.

John, St., "THE BAPTIST," the son of Zachariah, a priest, and Elizabeth, kinswoman of Mary, the mother of Jesus, was born in Judah six months before the birth of Christ. We hear little of his subsequent life, save that in his thirtieth year he began to preach in the wilderness east of Jerusalem and to "baptize" in Jordan. To this baptism Jesus himself submitted, and was at once acknowledged as a superior. John ended his ministry by imprisonment and decapitation in the prison of Machærus, his doom having been brought about by his denunciation of the marriage of Herod Antipas with Herodias, his brother's wife.

John, THE EVE OF ST., a Christian festival celebrated during the middle ages on June 23. Fires were lit in the streets, and the younger members of the populace leaped over the flames amidst songs and dancing. Many superstitions have sprung up, the Irish thinking that all souls visited their death-place on this night, and the English that if anyone sat in a church porch all night he would see the souls of all those of that parish about to die in the following year come and knock at the door.

John, GOSPEL OF ST., the last of the four canonical gospels, the authorship of which is attributed to the apostle John by many of the early fathers, including Theophilus of Antioch, Irenæus, etc., the latter thinking that he also wrote the Apocalypse and Epistles. It is supposed to have been written at Ephesus in Asia, according to Irenæus, against the doctrine of Cerinthus, and this probably is the reason for the number of explanatory remarks on Jewish facts and customs. St. John is different from the rest, in laying the principal scenes of Christ's life in Judæa, and also because many events and sayings chronicled in the synoptic Gospels, such as the sermon on the mount and the agony in the garden, are left out and new persons and places are introduced.

John SANSTERRE, or LACKLAND, the youngest son of Henry II. and Eleanor of Aquitaine, was born in 1167, and destined by his father to found the kingdom of Ireland. He went to that country in 1185, but his unbearable temper caused his speedy recall. He then joined Richard in the revolt which proved a death-blow to the king, and was rewarded but distrusted by his brother with good cause. During the absence of the latter in the Holy Land he acquired a sort of titular authority in England, and allied himself with Philip Augustus of France, Richard's bitter foe. Richard, however, named him as his heir on his death-bed, ignoring the hereditary claim of Arthur of Brittany, whom Philip forthwith supported. John divorced his first wife and married Isabella of Angoulême, betrothed already to the Count of La Marche. In the war that ensued, though Arthur vanished mysteriously from the scene, all the English possessions in western France were lost. John's next trouble was with the Pope (Innocent III.), whose nominee for the Archbishopric of Canterbury, Stephen Langton, the king refused to accept until placed under an interdict and threatened with invasion by Philip. Against that monarch he now endeavoured to stir up the Germanic confederacy, but his barons both in England and France declined to serve, the Emperor Otho was defeated at Bouvines, and John was forced into the peace of Chinon, 1214, whereby he ceded all his territories north of the Loire. He now had to face a league of the English barons, stimulated by Langton, and as a means of escape signed the Magna Charta at Runnymede, June 15, 1215. His undisguised intention to violate this compact and enforce his will by the aid of mercenaries, in which scheme the Pope encouraged him, led the barons to seek aid from France. Louis, the son of Philip, landed in England, and within a few months made himself master of all the south. John, whilst leading his army across the Wash, was caught by the tide, lost all his baggage and treasure, and worn out by fatigue, depression, and excesses, took refuge in Newark, where he died in 1216.

John, DON, of Austria, the natural son of the Emperor, Charles V., by Barbara Blomberg, was born at Ratisbon in 1545. Under the name of Geronimo he was conveyed to Spain, privately

educated, and acknowledged by his father before the latter's death. Philip II. treated him as a brother, and he showed his gratitude by revealing the schemes of the Infante Don Carlos. Philip appointed him Captain General of the Spanish Navy, and employed him (1569-70) in the odious task of expelling the Moriscoes. He next became admiral of the league against the Turks, and in that capacity won the decisive battles of Lepanto and Navarino (1571-2). The king felt some uneasiness at the growing ambition of his kinsman, whom the Pope encouraged for motives of his own. In 1576 he was appointed to the government of the Netherlands, with a secret design for the subjection of England. William of Orange, however, was able to make some stand against the Austrians and their allies from Parma, when just as the crisis was imminent Don John died at Namur in 1578, not without some suspicions of poison, which were almost warranted by the jealous character of his half-brother.

John OF BRUGES. [VAN EYCK.]

John OF DAMASCUS. [JOANNES.]

John OF GAUNT, or GHENT, Duke of Lancaster, the third son of Edward III. of England, was born in 1340. As Earl of Richmond he married Blanche of Lancaster, and became by her father of Henry IV. On her death he took as his second wife Constance, natural daughter of Pedro the Cruel of Castile and Leon, and claimed that throne in her right, but was defeated by Henry of Trastamare. He served with his brother, the Black Prince, in the French wars, and on the death of the latter appears to have acted virtually as regent. In 1378 he led an expedition into Brittany without much success, and he made a plucky attempt on the death of Henry of Castile to seize the crown, but after much bloodshed accepted a pecuniary compensation, his eldest daughter, Philippa, marrying the King of Portugal, whilst a younger one, Katherine, became the wife of the Prince of the Asturias, ultimately Henry III. of Castile. In 1396 John married Katherine Swynford (sister-in-law, perhaps, of Chaucer), by whom he had already had several illegitimate children, who were ennobled by the king. He died in 1399.

John OF SALISBURY was born at Salisbury a little before 1120, and was of Saxon race. He went early to France and became a pupil first of Abelard and then of the founders of the School of Chartres. Returning to England he was for thirteen years secretary to Theobald, Archbishop of Canterbury, and frequently went on missions to Rome. Thomas à Becket retained his services, and he followed his master abroad, and was present at his assassination. He then retired to France, was made Bishop of Chartres, and died about 1180. His *Life of St. Thomas* and *Life of St. Anselm* are of considerable historical importance, whilst his other works entitled *Policraticus* and *Metalogicus* throw great light on the state of education and the currents of thought during the reign of scholasticism.

John, PRESTER. [PRESTER JOHN.]

John OF NEPOMUK, or Pomuk, a Romish saint and patron of Bohemia, was born at Pomuk in that country about 1330. Becoming a priest at Prague, where he was made canon and vicar-general, he took part with the archbishop, John of Janstein, who appointed an abbot in opposition to the wishes of King Wenceslaus; and the latter, who had already a quarrel with him because he had refused to reveal the confessions of Queen Sophia, seized the insubordinate churchman, put him to the rack, and finally threw him into the Moldau. After his death many legends attached themselves to his name (indeed, his existence is not beyond doubt), and in 1729 he was canonised.

John, the name of twenty-three popes, the first of whom was elected in 523, whilst the last died in 1419.

John XXII. (JACQUES DE CAHORS) was elected at Lyons in 1316. He took the side of Frederick of Austria against Louis of Bavaria in the dispute for the imperial crown, and was formally deposed by Louis, who invaded Rome. John, however, continued to exercise his authority at Avignon, where he had always resided, and where he died in 1334. He was the author of the decretal known as "the Extravagantes," and was a bitter opponent of the Franciscans.

John XXIII. (BALDASSARE COSSA) succeeded Alexander V., whom he is said to have murdered, in 1410. Originally a corsair, he retained many of his old habits, leading a turbulent and licentious life. Two popes were already in existence at the time of his election, and he was compelled to summon a council at Constance to settle their conflicting claims. The verdict went against him, and he was deposed. The Emperor Sigismund imprisoned him for four years at Heidelberg, but he made peace with Martin V., was appointed bishop of Frascati and dean of the College of Cardinals, but died soon after in 1419.

John I., King of Portugal, the natural son of Pedro I., was born in 1357, and after a struggle against the rival claim of Beatrice, wife of John of Castile, succeeded his legitimate brother on the throne in 1385. He successfully resisted the efforts of the Castilians to subjugate Portugal, and by his strenuous and judicious policy secured the independence and future colonial greatness of his kingdom. In these schemes he was assisted by the sons of his marriage with Philippa, daughter of John of Gaunt, Henry the Navigator being especially distinguished. After a reign of forty-eight years, John died in 1433, and is still spoken of as "the father of his country."

John VI., the last king of that name in Portugal, was acting as regent for his insane mother, Maria I., when the French invasion drove him from Lisbon in 1807. He established himself at Rio de Janeiro as Emperor of Brazil, and allied himself with England and the other powers against Napoleon. In 1816 he succeeded to the throne, but did not return to Portugal until 1821, when he had to suppress the insurrection of his son, Dom Miguel. He died in 1826.

John, or JOHN III., of Poland (Sobieski), was born in 1624, being the son of the Castellan of Cracow. His military abilities put him at the head of the Polish army, and he kept in check the Cossacks of the Ukraine, as well as the Turks, whom he utterly defeated in 1673 at Choczim. Next year he was elected king, and continued his successes, raising the siege of Vienna in 1683. He died in 1696. His granddaughter was the wife of the Old Pretender.

Johnson, ANDREW, the son of humble parents, was born at Raleigh, North Carolina, U.S.A., in 1808. He learned the trade of tailoring, and devoted his leisure to self-education and political agitation, being settled at Greenville, Tennessee. At the head of a Democratic working-men's party, he got a seat in Congress in 1843, and ten years later was elected Governor of his state, from which position he passed to that of Senator in 1857. To the indignation of his party, he adopted the Republican views of Lincoln as regards the preservation of the Union, and in 1864 obtained the Vice-Presidency. The murder of Lincoln a few months later raised him to the Presidential chair, where he was welcomed with a cordiality that did not last long. His tenure of office was one long wrangle with Congress, chiefly as to the terms on which the Union was to be reconstituted, and in every point he was beaten. He then attempted to remove Stanton and other opponents from office, was impeached, and narrowly escaped condemnation. He made way for Grant in 1869, and was contemplating a return to public life when, in 1875, he died somewhat suddenly.

Johnson, SAMUEL, was born at Lichfield on September 18th (N.S.), 1709. His father was a bookseller in the place, who on market days opened a stall at Birmingham and other towns, each of which was then too small to support a regular shop. From him Johnson inherited the "vile melancholy" which clouded his spirits throughout his life, and, to the teaching which he received from him, may be traced the foundation of his belief in High Church and Tory doctrines. As a child he was touched by Queen Anne for the "king's evil," scrofula. As a boy he was educated first at a school in Lichfield, and then, probably in the capacity of pupil teacher, at Stourbridge. On leaving school he lived for two years at home, reading in a desultory manner, and, no doubt, acquiring the scholar's knack, for which he was afterwards famous, of going straight to the valuable points of a book, without waste of time upon the unnecessary padding. In 1728 he entered Pembroke College, Oxford, but spent a chequered life at the university. We have hints of his delight in vexing the tutors and fellows, and glimpses of him lounging at the College gate, and holding a group of friends entranced by his conversation, of an attack of hypochondria, of a deep religious impression through the reading of Law's *Serious Call*, of a poverty so great that his feet peeped through his shoes, and of a pride so high that he flung away the pair of boots which a friend delicately placed at his door. He left without a degree, probably on account of his straitened circumstances, and was usher for a few months in a school at Market Bosworth, where he was

harshly treated by Sir Wolstan Dixie, in whose house he acted as a kind of chaplain. He then settled for a time in Birmingham, where he published his first book, a translation from the French of Lobo's *Voyage to Abyssinia*. In 1736 he married Mrs. Porter, the widow of a Birmingham mercer, twenty years older than himself, who had the sense to discern beneath his "tumultuous and awkward fondness" the qualities which made him great. He next opened a school at Edial, near Lichfield, where almost his only pupils were David Garrick and his brother. Renouncing the scholastic profession, he went to London in 1738, and there wrote part of *Irene*, a tragedy, which was not brought out until 1749, when Garrick placed it on the stage without any great success. The year 1738 was also marked by his publication of a most popular poem, "London," in imitation of the Third Satire of Juvenal, and by his first contribution to *The Gentleman's Magazine*, for which, a little later, he composed more or less imaginary reports of the debates in Parliament, called, by a thin disguise, "The Senate of Lilliput," taking care, as he afterwards boasted, not to "let the Whig dogs have the best of it." These employments, however interesting, were not particularly well paid, and at times the poor author was obliged to roam the streets all night for lack of money with which to pay for a lodging. His companion on these occasions was Savage, whose life he wrote in 1744. It was not until 1747 that he obtained profitable work, when he undertook, for a payment of £1,575, to write "A Dictionary, with a Grammar and History of the English Language." The plan of the book was at once published, with a dedication to Lord Chesterfield, who accepted it graciously, but displayed no further interest in Johnson until 1755, when, on the eve of the appearance of the Dictionary, he wrote articles in praise of its author, who refused so tardy a help in a letter which gave a heavy blow to literary patronage. "Seven years, my lord," he said, "have now passed since I waited in your outward rooms, or was repulsed from your door; during which time I have been pushing on my work through difficulties, of which it is useless to complain, and have brought it, at last, to the verge of publication, without one act of assistance, one word of encouragement, or one smile of favour. Such treatment I did not expect, for I never had a patron before." Meanwhile, in 1749, Johnson had published another imitation of Juvenal, *The Vanity of Human Wishes*. Between 1750 and 1752 he brought out a periodical, *The Rambler*, which passed through two editions in London during his lifetime, and between 1758 and 1760 a similar production, *The Idler*. In 1752, to his deep and lasting regret, he lost his wife. Some years later, to defray the expenses of his mother's last illness, he wrote, in the evenings of a single week, one of his most popular books, *Rasselas*, the story of a prince who illustrated his favourite doctrine of the vanity of all things earthly. In 1762 he received a pension of £300 a year, the greater part of which he devoted to charity, turning his house into a home for several poor friends. He lived himself much with the Thrales, a brewer and his wife, at Streatham and Southwark, and, when

in town, he spent his evenings in the company of Reynolds, Goldsmith, Burke, and other eminent men, at "The Literary Club," which was founded in 1764. He brought out an edition of Shakespeare in 1765, an account, ten years later, of his visit to the Hebrides with Boswell, and a few political pamphlets, of which one, *Taxation no Tyranny*, attempted to answer the claims of the colonists at the beginning of the American War. His last great work, *The Lives of the English Poets*, was published in 1781. He died on December 13th, 1784. His writings are now, perhaps, less read than they deserve to be, on account of the pompous style of much of his prose. He lives to the present generation, in the pages of Boswell's biography, as the literary dictator of his time. He comes before us, already an elderly man, with awkward gestures and slovenly habits, but with a great tenderness of heart and a ready, though rough, wit which makes his conversation as fresh as if just spoken. To know him in his home, at his club, in the Highlands, at Streatham, is to live again in the very life of eighteenth-century England.

Johnston, ALBERT SIDNEY, born in Kentucky, U.S.A., in 1803, was educated at the West Point Military College, and after serving for some years in the United States Army went to Texas, enlisted as a private, and rose in a few months to the chief command. From 1840 to 1846 he farmed land as a simple citizen, but in the latter year took part in the Mexican War. He next received a major's commission from the United States Government, and in 1857 was entrusted with the expedition to Utah. Superseded later on for his Secessionist views, he accepted a command in the Confederate Army, and was killed at the Battle of Shiloh in 1862.

Johnston, ALEXANDER KEITH, was born at Kirkhill, near Edinburgh, in 1804, and educated at the High School. Joining his brother as an engraver and printer, he took up map-making and general geography with ardour, and produced in 1843 the *National Atlas*, which won for him the position of Scottish Geographer Royal. His splendid *Physical Atlas* appeared in 1848, and was followed by the *Dictionary of Geography*, *The Royal Atlas*, and many other valuable publications. Most of the learned and scientific bodies of Europe bestowed honours upon him, and in 1871, the year of his death, he received the Victoria Medal of the Royal Geographical Society. His son of the same name assisted in his later enterprises, but only survived him eight years.

Johnston, SIR HARRY HAMILTON, F.R.G.S., K.C.B., was born in 1858, and educated at King's College. He subsequently studied with success in the Royal Academy School, but in 1880 began a life of adventure by travelling in Tunis and Algeria, whence he passed to the Congo and West Africa, and in 1884 led an exploring party to Mount Kilimanjaro. He was now appointed Vice-Consul for the Cameroons and Oil River, being transferred in 1887 as Acting Consul to Benin and Biafra, and in 1888 becoming Consul for Portuguese East Africa. Later he acted as Commissioner and Consul-General

in the region N. of Zanzibar, and from 1899 to 1901 he was Special Commissioner and Consul-General for the Uganda Protectorate. He is the author of several important works, among the latest being *The Nile Quest* (1903), *Liberia* (1906), *Geo. Grenfell and the Congo* (1908), and *The History of the British Empire in Africa* (1909).

Johnston, GENERAL JOSEPH ECCLESTON, was born in Virginia, U.S.A., in 1807. Entering the army, he had attained the position of Quarter-master-General when in 1861 the Civil War broke out. He resigned and joined the Confederates, receiving command of all the forces in Virginia, and was severely wounded at Fair Oaks. In 1863-4 he was employed in a vain effort to check Sherman's advance, but after Lee's surrender was forced to capitulate. In 1885 he was appointed by President Cleveland to a Commissionership of Railways. He died in 1891.

Joint. A joint or articulation is the term applied to the means of connection between two distinct portions of the animal skeleton. The ends of the bones entering into the formation of a joint are covered with cartilage, and are united to one another by ligaments, while, surrounding and enveloping the apposed surfaces in the case of movable joints, there is what is known as the synovial sac containing synovial fluid, which facilitates the gliding of the one surface upon the other. A joint which does not allow of any movement is termed a *synarthrosis* or *synchondrosis*. Movable joints are classified as *amphiarthrosis* (symphysis) and *diarthrosis*; the mobility in the former being only partial, while in the latter it is considerable. *Diarthrosis* includes the more familiar forms of joint, such as the hinge-joint or ginglymus, *e.g.* the elbow and ankle; the ball and socket-joint, *e.g.* the hip and shoulder; the gliding joint, *e.g.* the articulations of the wrist; the pivot joint, *e.g.* that between the first two vertebræ; and the condyloid joint, *e.g.* those between the wrist-bones and the first phalanx of the fingers.

Diseases of Joints. *Synovitis* is inflammation of the synovial membrane of a joint. It may be acute or chronic. In the acute form the inflammatory effusion may become purulent, leading to the formation of an abscess in the joint. Chronic synovitis may result from injury or be associated with rheumatism, gout, syphilis, etc. In the treatment of synovitis rest is of great importance, and the limb is usually placed in a splint, and blistering may be employed, or some form of mercurial ointment used. In the event of the formation of pus in the cavity of the joint, an operation is usually necessary. *Hydrops articuli* is a condition in which the synovial cavity becomes distended by watery effusion. It is a not uncommon after-result of synovitis, and is sometimes a very persistent affection.

Arthritis is the term applied when inflammation affects all the structures entering into the composition of a joint. An acute form of arthritis is met with in young children. Arthritis may be of tubercular origin (HIP-DISEASE), and a common form of joint inflammation is what is known as chronic rheumatic arthritis or osteo arthritis.

Loose bodies are sometimes met with in joints, the knee being most frequently affected; they may consist of pieces of cartilage which have become detached, or may originate in a hypertrophied portion of the synovial membrane. Their treatment usually calls for surgical interference.

For the stiffening of joints see *ankylosis*.

Excision of a joint is an operation which has been frequently performed of recent years in cases in which amputation of the affected limb would have been formerly deemed necessary. **JOINTS**, in *Geology*, are divisional planes occurring in many rocks, both aqueous and igneous, independent of any original stratification, but of the highest practical importance as facilitating quarrying. Thin beds free from joints are known as *flagstones*. The joints in sedimentary rocks are generally in two sets, those of each set parallel, but the two sets at right angles to one another and to the bedding-planes of the rock. Two joints of each set and two planes of bedding thus form six sides of a cuboidal block of stone, and a rock so divisible is termed a *freestone*. Among inclined rocks one set of joints is commonly parallel with the strike (q.v.) and the other with the dip, and they are known as *strike-* and *dip-joints* respectively. One set, commonly the strike-joints, is often more strongly marked, more gaping, than the other, and is known to quarrymen as the *master-joints*, the others being called *cutters*. In coal-mining the main galleries are generally carried along the master-joint, *face*, or *cleet* of the coal, in which direction it has a smooth, polished surface, the cross-galleries being along the less strongly jointed *ends* of the coal, which appear broken. Even hand specimens of coal exhibit a cuboidal form, four faces formed by these joints and two by the powdery, flaking bedding-planes, sometimes bearing fossil leaves. A thick-bedded limestone in which the joint-planes are not sharply cut is termed a *ragstone*. Such jointing in aqueous rocks seems to be the result of strains set up during upheaval or folding. The production of rectangular jointing by strain has been experimentally illustrated by M. Daubrée by wrenching thick plates of glass. Though known by the same name, it is probable that the joints in igneous rocks are quite distinct in mode of origin, they being apparently entirely the result of shrinkage during cooling. The most remarkable joints among igneous rocks are those in basalts, which divide them into very regular columns perpendicular to their surfaces of cooling. In the sheets of Antrim, Fingal's Cave, or Idaho, for instance, this *columnar jointing* is vertical; but in dykes the columns are often horizontal, two sets having clearly originated one from each cooling surface. They are often, but by no means always, six-sided, being seemingly due to the intersection of three sets of joints at angles of about 120°; but they are frequently also intersected by a fourth set, parallel to the surface, and have sometimes an elaborate ball-and-socket articulation at the intersections. The whole of these structures is believed to be explicable as the result of the cooling of a rock not perfectly homogeneous from an extended surface. In addition to their importance in quarrying, joints largely determine

the direction of percolating water and consequent weathering. Limestone caverns are often dissolved out along lines of joint: frost, acting along similar lines, detaches masses from cliffs; and the granite tors of Devon and Cornwall are similarly produced. Weather or sea acting mainly along one set of joints may form *buttresses*, as in the Carboniferous Limestone of Derbyshire dales; or, subsequently acting along the other, may convert such buttresses into *pinnacles* or *sea-stacks*, as in the Saxon Switzerland or off the coast of Caithness.

Joint tenancy. When lands are granted to two or more persons to hold to them and their heirs, or for the term of their lives, or for the term of another's life, without any restrictive, exclusive or explanatory words, all the persons named in such grant, to whom the lands are so given, take a joint estate, and are thence called joint tenants. On the death of either, without partition, the estate descends to the survivors, but the jointure may be destroyed by alienation of one joint tenant, whereby the joint tenancy is severed and a "tenancy in common" ensues.

Jointure. A settlement of lands or tenements made to a woman on account of marriage. It is defined by Lord Coke to be a "competent livelihood of freehold for the wife of lands or tenements, etc., to take effect presently in possession or profit after the decease of her husband, for the life of the wife at least." The woman on whom such a settlement of lands is made is termed a jointress. To a legal jointure five incidents are necessary. 1. The provision for the wife must take effect in possession or profit immediately after her husband's death. 2. It must be for her own life, at least, and not *pour autre vie*, or for any term of years, or for any smaller estate. But the widow will be bound by the acceptance of a precarious interest if she were adult at the time of agreeing to the jointure. 3. It must be made to herself and no other in trust for her. 4. It must be made in satisfaction of the whole, and not of part of her dower. 5. It must be either expressed or averred to be in satisfaction of dower. It may be made either before or after marriage: if made after marriage she may waive it, and claim her dower, unless it be provided by Act of Parliament. [DOWER.]

Joinville, JEAN DE, was born of distinguished family in Champagne, France, in 1224. He took service under the Counts of Champagne, went to the court of Louis IX., and in 1248 joined that king in the first crusade, shared his captivity, and returned with him at the end of six years. Deeply attached to his saintly master, he remained one of his close personal attendants until his departure on his fatal expedition, and he bore testimony in favour of his canonisation. He was over seventy when, at the request of Jeanne de Navarre, he began to compile his *Histoire de St. Louis*, and it was not completed until 1309. His gossiping and even garrulous chronicle is exceedingly interesting, but it is redeemed from pettiness by the honest veneration which is everywhere shown for the character of the chivalrous king. The writer died at the age

of ninety-five on his estate at Joinville, which in 1688 passed to the Dukes of Orleans, and so gave a title to a younger member of that family.

Joinville, FRANÇOIS FERDINAND PHILIPPE, ETC., D'ORLEANS, PRINCE DE, the third son of Louis Philippe of France, was born at Neuilly in 1818, and entered the French navy very early, becoming lieutenant in 1836. With the Duc de Nemours, his brother, he took part the following year in the capture of Constantine. His next service was in Mexico, where he assisted in bombarding San Juan d'Alloa, and led the assault on Vera Cruz. In 1841 he was chosen to escort the body of Napoleon from St. Helena, and two years later he married the sister of Pedro II., Emperor of Brazil. His scientific attainments proved most useful in the adaptation of the French navy to steam power, but his last active employment afloat was in command of the squadron that bombarded Tangiers, and took Mogador in 1844. During the events that led to the retirement of his father in 1848, he happened to be in Algeria with the Duc d'Aumale, and for some years he shared the exile of the Royal Family in England. In 1862 he went through a campaign in Virginia as the guest of McClellan, and in 1870, under an assumed name, he fought in the Army of the Loire. Later his occupations, however, were chiefly literary, and for the last forty years of the 19th century he wrote ably in the French periodicals on naval and military subjects. Devoid of political ambition, animated by a sincere patriotism, and content with the life of a simple country gentleman, he lived in France under the Republican régime without provoking suspicion or ill-will. He died in 1900.

Jokai, MOR, or MAURUS, was born at Komorn, Hungary, in 1825. His father, an advocate of strict Calvinistic views, died twelve years later, and the boy, completing his own education, became at the age of one-and-twenty editor of the *Wochenblatt* at Pesth. In 1848 he joined the revolutionary movement, and was present at the surrender of Vilagos, when in despair he contemplated suicide. However, his wife, a famous tragic actress, got him safely back to Pesth, where he abandoned journalism and took to fiction. His novels, novelettes, and plays soon became exceedingly popular, nor did the supply fail. *The Good Old Assessors*, *A Hungarian Nabob*, *Sad Times*, *The White Rose*, *The New Landlord*, *A Romance of the Next Century*, and *Black Diamonds* are among the best known. In 1863 he founded the *Hon* (Fatherland), which had a larger circulation among the Magyars than any other newspaper. He died in 1904.

Jolly Balance, a special form of sensitive spring-balance named after its inventor. A long, fine spiral spring is supported on a vertical stand, and bears a small scale-pan at its lower extremity. The stand carries a long, vertical strip of mirror-glass, on which a scale is engraved. The amount of extension produced by any load in the scale-pan is read off on the scale, the mirror helping to avoid parallax (q.v.), and enabling the observer to take an exact reading. This balance is generally used in estimations of the density of solids or liquids.

where it is unnecessary to know the exact equivalent in weight-units of the extensions produced.

Jolly Boat, a ship's boat, smaller than a yawl, used for going ashore and for light work.

Jomini, HENRY, BARON, the son of a Swiss magistrate, was born at Payerne, in the canton of Vaud, in 1779. Though yearning for a military life, he entered a French bank, but the Swiss Revolution called him home, and at the age of nineteen he became Chief Secretary of War. In 1801 he returned to Paris, and Ney took him as his private secretary. His *Traité des Grandes Opérations Militaires*, presented to Napoleon on the field of Austerlitz (1805), brought him into favourable notice, and when next year he published his essay on the prospect of a war with Prussia, the Emperor attached him to his person. After the Peace of Tilsit he was made chief of Ney's staff, but the jealousy of that general during the Spanish campaign of 1808 drove him to seek employment from the Tsar. Napoleon forbade this, and on his refusal to serve against Russia appointed him Governor of Wilna, in which capacity he did much to facilitate the retreat from Moscow. The Battle of Bautzen was won chiefly through his strategy, yet he failed to secure his share of the rewards, and he finally joined the Russian Army, assisting in the German campaigns, but declining to take part in the invasion of France. After 1815 he settled in Paris, where he produced his great works, *Principles of Strategy*, *History of the Campaigns of the Revolution*, *The Public and Military Life of Napoleon*, etc. He served in the Turkish War of 1828, and superintended the military studies of the Tsarevitch, dying in Paris in 1869.

Jonah, the character who plays the chief part in the Scriptural book that bears his name, is only once mentioned elsewhere in the Old Testament, viz., in the Second Book of Kings xiv. 25, where one of his prophecies is said to have been fulfilled in the reign of Jeroboam II. The references to Jonah in the New Testament show that the symbolical character of the book had a strong hold upon the Hebrew mind. The style betrays archaisms and possibly interpolations, which may or may not point to the existence of some ancient original or to an artificial imitation of primitive models.

Jones, ERNEST CHARLES, the son of an equerry to the Duke of Cumberland, was born in Berlin in 1819, and having come to England attracted notice by a clever romance, *The Wood Spirit*, published in 1841. He was called to the bar, but neglected his profession to take up the Chartist movement, of which he became the literary leader. So zealous was he that he refused a fortune of £2,000 a year coupled with the condition that he should abandon the cause. In 1848 he was sentenced to a couple of years' imprisonment for sedition. He wrote in jail with his own blood on the leaves of his prayer-book, ink and paper being denied him, an epic poem entitled *The Revolt of Hindustan*. On his release he made several ineffectual attempts to enter Parliament, and was at last successful in Manchester, but on January 26,

1869, three days after his election, died from the effects of a chill incurred in the contest.

Jones, INIGO, "the English Palladio," the son of a clothworker, was born in London in 1572. Nothing is known as to his youth, except that he went to Italy, possibly through the generosity of the Earl of Pembroke or the Earl of Arundel, to study art. He came back with some reputation, and in 1604 was invited by the King of Denmark to Copenhagen, where he designed the Rosenborg and Frederiksborg palaces. He thus secured the patronage of Anne of Denmark and Prince Henry, by whom he was employed in providing scenery for masques, in which capacity he fell foul of Ben Jonson, who treated him with utter contempt. In 1612 James I. appointed him surveyor-general of royal buildings, and commissioned him to rebuild the palace at Whitehall. The banqueting-house was the only part that he completed, and it is the best of his works, among which may be reckoned St. Paul's, Covent Garden, the Queen's House, Greenwich Park, the Piazza, Covent Garden, Lincoln's Inn Fields, and the remarkable Corinthian portico of St. Paul's, besides numberless country mansions. He continued to hold his offices under Charles I., and was heavily fined by the Commonwealth as a malignant. In poverty and sorrow he struggled on for two years after the king's execution, dying in 1651.

Jones, OWEN, the son of a prosperous furrier and Welsh archaeologist, was born in London in 1809, and carefully educated as an architect. Powerfully impressed by the sight of the Alhambra, he concentrated his attention on the internal decoration of buildings, and may fairly be said to have brought about a revolution in taste, especially as regards the use of colour. He took part in the creation of the Exhibition of 1851, and arranged the beautiful courts in the Crystal Palace at Sydenham, having as his colleague Sir Digby Wyatt. He built St. James's Hall in 1858, but most of his later years were spent in the decoration of private mansions, one interesting exercise of his skill being the adornment of the Palace of the Khedive. He also wrote many books on his favourite theme, and of these *The Grammar of Ornament* is the most valuable. He died in 1874.

Jones, PAUL, properly John Paul, a notable corsair, was born at Kirkbean, Kirkcudbright, in 1747, and was the youngest child of the head gardener to Mr. Craik of Arbigland. Bound apprentice at the age of twelve to a captain in the American trade, he afterwards shipped in a slaver, and at one-and-twenty obtained command of a brigantine. He next became a smuggler, and then a trader to the West Indies. In 1773 he was left some property in Virginia and went to America, assuming there the name of Paul Jones. In 1775 he obtained a lieutenant's commission in the newly-organised Continental Navy, and served at the capture of New Providence. Soon afterwards he was given command of the *Providence* sloop, and cruised with much success against the English trade, exhibiting great boldness and resource. His

next ship was the *Ranger*, 26, and in her he crossed to France, where he seems to have obtained recognition of the American flag. Thence he made a rapacious descent on Whitehaven and St. Mary's Isle, and captured the British sloop *Drake* off Belfast Lough. Later, his own crew having mutinied and gone home, he fitted out an old French Indiaman which he renamed *Bonhomme Richard*, with which, in conjunction with other vessels, all French, yet flying the stars and stripes, he made several prizes. On September 23rd, 1779, having with him the *Alliance* and the *Pallas*, 32, he engaged off Flamborough Head the *Serapis*, 44, and the *Countess of Scarborough*, 20, and after a sharp action took both of them, his own ship, however, subsequently sinking. Jones returned to America in 1780 in the *Ariel*, 20, another British prize. He was afterwards entrusted with more than one quasi-diplomatic mission to Europe, accepted a rear-admiral's commission in the Russian Navy, and later died in Paris of dropsy in 1792. His remains were transferred to America with naval honours in 1905.

Jones, THOMAS RYMER, F.R.S., was born in 1810, and having been educated as a surgeon in London and Paris, abandoned practice for the study of comparative anatomy, to the chair of which science in King's College he was elected very early. In 1838 he published his *General Outline of the Animal Kingdom*, and two years later was appointed Fullerian professor in the Royal Institution. He got the Fellowship of the Royal Society in 1844, and as a lecturer and a writer was before the public until his death in 1880.

Jones, SIR WILLIAM, was born in London in 1746. He lost his father, an eminent mathematician, in childhood, but his education was carefully watched by his mother, who sent him to Harrow and thence to University College, Oxford. Even at school he began to study Oriental as well as classical and modern languages, and he had acquired at the age of twenty-two such a reputation that he was invited to translate the life of Nadir Shah into French, and this he followed up by a metrical version of Hafiz. Five years were spent as tutor in Earl Spencer's family, and then the young scholar began to read for the bar. He found time, nevertheless, for a reply to Anquetil du Perron, for a Grammar of the Persian Language, and for two volumes of criticism, before devoting himself to his profession. In 1776 he was appointed Commissioner in Bankruptcy, and in 1783 he became Judge of the Supreme Court at Calcutta. He now took up the study of Sanskrit, and produced a translation of the *Sakuntala*, the *Hitopadesa*, the *Ritusamhara*, and part of the *Vedas*. Moreover, he commenced *A Digest of Hindu Laws*, completed by Colebrooke, and he founded the Asiatic Society. His last work, a translation of *The Institutes of Manu*, appeared in 1794, just before his sudden death from liver disease. As a pioneer of Aryan philology he did an important work.

Jonquil (*Narcissus Jonquilla*), a small, many-flowered yellow species of *Narcissus* (q.v.), from the flowers of which a bitter, yellow, fragrant essential

oil is extracted by ether. It is frequently confused with the Daffodil and Narcissus.

Jonson, BENJAMIN (b. circa 1574, d. 1637), dramatist, was educated at Westminster. After following the trade of a bricklayer, he went as a volunteer to Flanders, and on his return became an actor, also writing plays in conjunction with others. His first independent work, *Every Man in His Humour* (1596), was followed by *Every Man Out of His Humour* (1599), *Cynthia's Revels* (1600), *Sejanus* (1603), *Volpone* (1606), *The Alchemist* (1610), and many others. He wrote masques for the court of James I., and in 1616 was appointed Poet Laureate.

Jordan (Heb. "Swift-flowing"), the chief river of the Holy Land, has its source in a cave at Banias (Cæsarea Philippi), but is joined early in its course by a stream from Tell-el-Kadi in Dan, and by another from Hermon, either of which might claim to be the true Jordan. Descending rapidly with a fall of some 80 feet per mile, the river passes through Lake Merom (Huled), and enters the Sea of Galilee, from which it issues at a much reduced speed, the fall being no more than a dozen feet per mile in the plain of Beisan, and four or five feet as it makes its way through the muddy flats to the Dead Sea. The total length is 104 miles, and the average width below the lakes about 40 yards. The upper reaches are much obstructed by growths of reeds and shrubs, and though narrow it is deep, and can only be passed by the fords, of which there are many, the most famous being that of Bethabaca, near Jericho. In the spring it is subject to floods. The most important affluents are the Hieromax and Jabbok from the E., and the Jalud and Faria from the W.

Jordan, CAMILLE, born at Lyons in 1771, became a strong supporter of the Royalist cause, and when Lyons was taken by the Convention in 1793 had to fly for his life to Switzerland, and thence to England. Returning to France in 1796, he sat in the Council of the Five Hundred, but had to escape by exile the *coup d'état* of the 18th Fructidor. Though he boldly denounced Napoleon, he was allowed to come back and live peacefully at Lyons, writing much on German literature. The Restoration brought him rank and political position, which he used to resist reactionary measures in the Chamber. He died in 1821.

Jordan, MRS. (DOROTHEA BLAND), was born at Waterford, Ireland, in 1762, her mother being a strolling player. The girl made a brilliant début as Phœbe in *As You Like It* at the Dublin Theatre, and then, coming over the water, adopted from this fact the stage name of "Jordan," appearing at Drury Lane in 1785. She soon became a great favourite in comedy, and her beauty and wit attracted the attention of the Duke of Clarence, with whom she lived maritally from 1790 to 1810, and bore him ten children, the eldest of whom was created Earl of Munster. When it became obvious that the Duke would succeed to the throne, a separation was unavoidable. Her last appearance was at Covent Garden in 1814. After that misfortunes overtook her, bankruptcy followed, and

she retired to St. Cloud, where she died neglected and penniless in 1816.

Jordan, SIR JOSEPH, British naval commander, was born in 1603, and after much service as acting vice-admiral in the first Dutch War, and as rear-admiral under Blake in the Mediterranean, commanded the *St. George*, 60, and acted as flag-officer through the second Dutch War. He succeeded Lawson in 1665 when that officer was wounded. He commanded a flotilla of fire-ships against the Dutch at the Nore in 1667, and he was vice-admiral of the Blue at the Battle of Solebay. He died in 1685, and lies buried at Hatfield.

Jortin, JOHN, the son of a French Protestant refugee, was born in London in 1698, and went from Charterhouse to Jesus College, Cambridge, where he distinguished himself as a Greek scholar, and gave help to Pope in translating Homer. He was ordained soon after taking his degree, and ultimately became Vicar of Kensington and Arch-deacon of London, dying in 1770. Among his works are *Discussions Concerning the Christian Religion*, *Remarks on Ecclesiastical History*, *Life of Erasmus*, and *Tracts, Philological, Critical, and Miscellaneous*.

Jorullo, JURUYO, or **XURULLO**, a volcanic mountain in Mexico, 75 miles S.S.W. from Valladolid and 80 miles from the Pacific coast. It was suddenly upheaved on September 28-9, 1759, in the midst of a fertile plain, the disturbance extending over an area of 4 miles by 3 miles, and the central crater having an elevation of 4,265 feet above sea level. Since that date there has been little sign of activity, and the flanks are covered with forests.

Josephus, FLAVIUS, the Jewish historian, was born at Jerusalem in the year 37. The facts of his life rest upon his autobiography. From this we learn that he was of good family; that after living three years in the desert he became a Pharisee; that in the year 63 he went to Rome, where, through the intercession of Poppæa, he obtained the release of some Jewish priests; and that, on his return three years later, he took the command of the Jews when Galilee rose against the Romans. He held out in Jotapata for nearly fifty days, and then surrendered. His life was spared, but he was kept in chains for three years. He gained the favour of both Vespasian and Titus, and urged the Jews to surrender to the latter. After the fall of Jerusalem he lived as a Roman pensioner till about 103, when he died. His *Jewish War*, originally written in Aramaic, but translated by the author into Greek, is a vivid narration of Jewish affairs from the time of the Maccabees to the year 73. It is generally accurate, but was written with an eye to his patrons, being submitted to Vespasian, Titus, and Agrippa. His chief other work was *Antiquities of the Jews*, a learned but unequal account of the early history of his nation.

Joshua ("whose help is Jehovah"), the successor of Moses, was the son of Nun of the tribe of Ephraim. He is first mentioned as chosen by

Moses to lead the Israelite host against Amalek in the fight at Rephidim (Exodus xvii. 9). He accompanied Moses to the foot of Sinai when the latter first went to receive the two tables, and was one of the twelve who were sent to explore Canaan and one of the two who gave a good report of the land. He was in his eighty-fifth year when he became head of the people at Shittim. Under him the chosen people crossed the Jordan, took Jericho and Ai, defeated the Amorite confederation at Makkedah, overthrew the Canaanites under Jabin and in six years conquered as many nations. The land was then portioned out among the tribes and the Levites; the Tabernacle was established at Shiloh; and the covenant renewed at Shechem. Joshua, having delivered two solemn addresses to the people, died at the age of 110 and was buried at his native town, Timnath-serah. "Joshua" is a variant of Hoshea, Jeshua, and Jesus.

Joubert, BARTHÉLEMI CATHERINE (1769-99) a French general of great promise, was born at Pont-de-Vaux, department of the Aisne, and entered the army in 1791. He greatly distinguished himself on the Rhine and in Italy, rendering prominent services at Loano and Lodi, but winning his chief laurels at Castiglione and Rivoli. His campaign in the Tyrol which followed was called by Carnot "le campagne des géants," and forced Austria to come to terms. After commanding in Holland he next gained possession of Piedmont by a brilliant coup. His career was cut short at the battle of Novi, where he fell mortally wounded.

Joubert, JOSEPH (1754-1824), one of the greatest French writers of his day, was a native of Montignac, Périgord. He lived some time at Paris and enjoyed the friendship of Fontanes, La Harpe and Marmontel, as well as that of Diderot and D'Alembert. After some years of retirement he again came to Paris, and was the most brilliant figure in the *salon* of Madame de Beaumont. By means of Fontanes he became Inspector-General of the University of Paris. Extracts from his manuscript were published by Chateaubriand under the title of *Pensées*, and they were republished in more extended form by Raynal between 1842 and 1849.

Joubert, GENERAL PETRUS JACOBUS, the Commander-in-Chief of the Boer Army in the war against Great Britain (1899-1902), was born in 1831. He was the commander of the force that defeated Sir G. Colley at Majuba. He was one of the most progressive of the Boers, and in 1893 and in 1894 stood in opposition to Mr. Kruger for the Presidency. He died on March 27th, 1900.

Jouffroy, THÉODORE SIMON (1796-1842), French philosopher, was born at Pontets, Doubs. He studied under Cousin at the École Normale, and in 1817 became assistant professor of philosophy. He became an adherent of the Scotch school, wrote a preface to Stewart's *Moral Philosophy*, and translated some of Reid's works, to which he also wrote a preface. He was for some years a deputy in the French Assembly, but made no mark there.

and ruined his health. In 1833 he became professor of ancient philosophy at the Collège de France. His philosophical views are set out in his *Cours de Droit Naturel* (1835), *Mélanges Philosophiques*, and other works published posthumously. He had little originality, but possessed even more than the usual French lucidity in exposition.

Joule, JAMES PRESCOTT (1818-89), the electrician, was born at Salford. He studied under Dalton the chemist at the Manchester Philosophical Society, and very soon began to devote his time to chemical and physical research. He filled successively the offices of library secretary and president of the Manchester Society, was elected F.R.S. in 1850, and received the Copley Medal in 1860. In 1878 he was granted a civil list pension of £200, and in 1880 was presented with the Albert Medal of the Society of Arts, and he also received honorary degrees from Oxford, Dublin, and Edinburgh. His first discovery was connected with the production of heat by voltaic electricity, his second was the equivalence of heat and energy, and he also made various experiments in magnetism. His paper appeared under the auspices of the Physical Society, but edited by himself.

Joule's Equivalent, in *physics*, signifies the numerical connection between the unit of energy expressed in relation to force and space, and the unit of energy expressed as heat. That is to say, heat is a form of energy and may be measured as such. The unit of heat generally adopted is the *calorie*, which means the amount of heat required to raise one gramme of water from 0°C. to 1°C. This being a quantity of energy is expressible as a definite number of foot-pounds, or of ergs, or any other unit of energy we may choose to work with. The calorie is equivalent to 42,000,000 ergs; the pound-degree-Centigrade unit of heat is equivalent to 1,390 foot-pounds of energy; and the pound-degree-Fahrenheit unit to 772 foot-pounds. These numbers are the result of experiment, though any one may be calculated when any other is known. The most accurate experiments were made by Dr. Joule of Manchester, who adopted several methods in his determinations, and showed that all led to the same numerical result. The fact that there is such an equivalent is generally stated as the first law of thermo-dynamics.

Jourdan, JEAN BAPTISTE, COMTE DE (1762-1833), Marshal of France, was the son of a Limoges surgeon. He entered the army in his seventeenth year, and having shown himself a zealous republican as well as a good soldier, attained the rank of general. In 1797 he became a member of the Council of Five Hundred, and was responsible for the law of Conscription of 1798. His views, however, were too liberal for Bonaparte, and after his defeat at Stockach in 1799 he suffered a temporary eclipse. He soon, however, became a member of the Council of State, was employed in Piedmont, received in 1804 his marshal's bâton, and was one of Wellington's opponents in the Peninsula. Having deserted Napoleon on his fall, he was made *pair de France* by Louis XVIII.; but by the part he took in the Revolution of 1830 he returned to

the principles of his youth. He published accounts of some of the campaigns in which he had commanded, notably that of the Army of the Danube.

Journal, in *book-keeping*, a book in which every article and charge is separately entered on the debit or credit side, and classed so as to facilitate posting into the ledger.

Journal, in *engineering*, is that part of a shaft or or an axle that is supported at the bearings. It must be circular in section, and is usually made cylindrical with slight enlargements at each end to prevent lateral motion of the axle. The journal requires careful designing; if the amount of bearing surface is too small, it will become heated under the excessive pressure, the lubricating material will be squeezed out, and the journal will cut into the bearing.

Jowett, BENJAMIN (D.D. Leyden), Master of Balliol College, Oxford, and university reformer, was born in 1817, and educated at St. Paul's School and at Balliol. He became Fellow of his college in 1838, after gaining as an undergraduate the Hertford Scholarship. He was tutor of Balliol from 1842 to 1870, and was appointed in 1855 Regius Professor of Greek. The chief results of his scholarship were translations of Thucydides, Plato, and Aristotle's "Politics;" whilst as a theologian his contribution to *Essays and Reviews* marked him as a man of liberal views. He was Vice-chancellor from 1882 to 1886, and both before and afterwards took a most active part in university affairs. He died in 1893.

Juan Fernandez (or MAS-À-TIERRA), an island in the South Pacific, 400 miles from the coast of Chili, to which it belongs. Its area is eighteen miles by six miles. The interior is fertile, and fish in large quantities are taken upon the coast and cured by settlers for the Chilian market. Alexander Selkirk was alone on this island for four years (1705-9). It was used as a penal settlement from 1819 to 1835.

Juangs, an aboriginal people of Orissa, North-East India, occupying the Upper Baitarni valley, and now speaking a rude Kolarian dialect akin to that of the neighbouring Hos. But there is an undoubted strain of Negrito blood in the Juangs, as betrayed by their almost dwarfish stature, dark complexion, and frizzly hair, varying from black to a reddish brown. They are amongst the most primitive inhabitants of India. They burn their dead, but appear to have no clearly developed religious ideas beyond the crudest fetishism. (Dalton, *Ethnology of Bengal*, p. 152). These Jangali ("Jungle People") are steadily dying out.

Juarez, BENITO PABLO (1806-72), Mexican statesman of Indian extraction, first took part in political affairs in 1846. Having been Governor of Oajaca for four years, he was banished by Santa Anna, President of Mexico, in 1852. Three years later, however, he became Minister of Justice under Alvarez, and having been Secretary of State under that President's successor, became the Liberal candidate for the Presidency after Zuloaga's *coup d'état*. After a civil war he was elected by Congress in 1861 to the headship of the State; and Mexico became involved with the European powers on account of his measures. Outrages were committed

on Europeans, and the payment of their debts was suspended for two years. England and Spain joined France in sending troops to Mexico in 1862, but the latter power was soon left alone. Napoleon III. put forward the Archduke Maximilian for the throne, and did not withdraw his support of him until after the protest of the United States Government. The Republican cause was now triumphant; and Maximilian having been captured by treachery, was shot on June 19, 1867. The remainder of the life of Juárez was occupied in the struggle to maintain his position, which he was only able to do by the most arbitrary measures. In 1871 he was defeated by Díaz at the Presidential Election, but retained power by the favour of the populace. He died, however, when his position had begun to become secure.

Juba, a river in East Africa with a town of the same name at its mouth, which is at 0° 5' S. lat. It marks the boundary of the Zanzibar territory placed under British control by the Convention with Germany in 1890. Its course has been traced some distance northwards.

Jubilee, among the Jews the Sabbatical year in which all land that had been sold was returned to the original owner, and those who had sold themselves for slaves were made free. It probably gets its name from the word yobel, a kind of horn with which it was proclaimed. A somewhat analogous institution was adopted by the Latin Church under Pope Boniface VIII., personal emancipation being represented by remission from the penal consequences of sin. During the year 1300 indulgence was granted to all pilgrims who confessed their sins and visited the Church of St. Peter and St. Paul fifteen times, or if residents, thirty times. According to Boniface the Jubilee was to have been held every 100th year, but the interval was reduced by Clement VI. (1343) to fifty years, and by Urban VI. and Paul II. (1470) to twenty-five years. Paul II. appointed pilgrimages to churches in different countries, and enjoined the pilgrims to contribute towards the Holy Wars. Leo X. substituted the building of St. Peter's Church for the Holy Wars, and this, with the scandalous behaviour of some preachers of the indulgence, helped to bring about the Reformation. The word is also used to denote the 50th anniversary of anything; as the Jubilee of Queen Victoria's accession (1887). It was also used to denote the 60th anniversary of Queen Victoria's accession (the Diamond Jubilee, 1897).

Judah (YEHUDAH = "Praise"), the fourth son of Jacob and Leah. He interceded for the life of Joseph with his brethren, and was the most influential of Jacob's sons. As such he treats with his father concerning Benjamin, and is sent to prepare the land of Goshen for the reception of Jacob. His tribe also took the foremost place, and the most important part of Palestine was assigned to it for territory. Caleb and Othniel were exceptionally favoured in the division. The territory of Judah was about 45 miles long and 50 miles broad. David reigned first over this tribe at Hebron; and after his death it had a separate existence as a kingdom.

Judas, the Greek form of the Jewish "Judah." The chief persons who bore this name were:

1. **JUDAS**, surnamed Barsabas, a leading member of the Church at Jerusalem, who was chosen with Silas to accompany St. Paul and Barnabas to Antioch when they were to announce that the Gentiles were to be admitted into the Church.

2. **JUDAS OF GALILEE**, the leader of the revolt in Judæa against the payment of tribute to the Romans (A.D. 6). He was the founder of a sect of a very fanatical character called the Gaulonites.

3. **JUDAS ISCARIOT**, the betrayer of Jesus. He "kept the bag," and was tempted by his avarice to betray his Master. He afterwards repented and hanged himself. He seems to have been distrusted from the first.

4. **JUDAS**, most probably identical with **LEBBÆUS** or **THADDÆUS**, another of the Twelve. We know nothing of him, and even traditions vary. By some he is said to have died a martyr's death in Phœnicia; others make him preach in Persia and Mesopotamia. He is distinguished from Iscariot in St. John xiv. 22, and St. Luke calls him "Judas (son ?) of James."

Judas Maccabæus. (**MACCABÆUS.**)

Judas-tree (*Cercis siliquastrum*), a beautiful leguminous tree, growing wild from Japan to the shores of the Mediterranean, with smooth kidney-shaped leaves, glaucous above, and pink or red flowers, which spring from both old and young wood before the appearance of the leaves. From its appearance at this season the tree shares with the elder (q.v.) the sinister reputation of having formed the gallows of Iscariot. Its thin brown pods, nearly six inches long, are seldom produced in England.

Jude, the name of the writer of the "Epistle of St. Jude," one of the shortest and least important books in the New Testament. In v. 1 he calls himself "the brother of James," probably James, the Lord's brother, and then claims to be the Judas named among the Lord's brethren, St. Matt. xiii. 55, St. Mark vi. 3. In v. 17 he distinguishes himself from the apostles, so that most likely he was not Jude the apostle, who was also called Lebbæus and Thaddæus. There has been much discussion concerning St. Jude's Epistle, and it is not in the Syriac Bible, but was early included among the acknowledged Christian scriptures. The Epistle, which is largely identical with the Second of St. Peter, is addressed to Jewish Christians.

Judge. A judge (from the French *juge*, which is from the Latin *judicem*), in England and Wales, is one who presides in a court duly constituted, declares the law in all matters that are tried before him, subject to revision in cases where an appeal is allowed, and pronounces sentence or judgment according to law. The superior judges are those attached to the High Court of Justice, besides which there are the County Court judges and recorders of the several boroughs in the Kingdom, which have a grant of Quarter Sessions. When the judges are popularly spoken of, the judges of the Supreme Court (into which the jurisdiction of the ancient

Courts of King's Bench, Common Pleas, and Exchequer have been amalgamated by recent legislation) are meant, including the judges attached to the Chancery, Probate, and Admiralty divisions of the Supreme Court. The judges of the Supreme Court are appointed by the Crown, the County Court judges by the Lord Chancellor. Both classes have retiring pensions, regulated by length of service. No action lies against a judge for anything said or done in his judicial capacity, but if he act without jurisdiction he may be answerable for the consequences. If a judge has a personal interest in the action he is incapacitated from trying it. [JUSTICE, COURTS OF.]

Judge Advocate-General is the adviser of the Crown in reference to courts-martial and other matters of military law. He was formerly a member of the House of Commons, and of the Government for the time being. He sometimes acts by deputy duly appointed. The duties of an officiating judge-advocate at a court-martial are to provide accommodation for the court, to administer the oath to the members of the court and the witnesses, to make a minute of the proceedings, and to advise the court on points of law, of custom, and of form, and so far to assist the prisoner as to elicit a full statement of the facts material to the defence. The proceedings of general courts-martial held both at home and abroad are transmitted by the officiating judge-advocate to the judge advocate-general, to be laid before the Crown with a statement by the officiating judge-advocate of any circumstances which, in his opinion, may affect the validity of the decision. In the navy, when a court-martial has been ordered, the person nominated president appoints an officiating judge-advocate or his deputy, and the proceedings are nearly the same as in a military court-martial.

Judges, the Book of, a canonical book of the Old Testament, is a sequel to the Book of Joshua, and relates to the period between his death and the birth of Samuel. Its author, or rather authors—for it must be the work of more than one—are unknown. It has two beginnings (Chap. i. 1; ii. 6). Chapter i. is a history of Joshua's time, and therefore the words "after the death of Joshua" must have been written by someone who wished to make the whole book read continuously with that which precedes it. The history keeps repeating itself. The people fall away and are punished, until Jehovah, pitying them, raises up a judge to deliver and recall them. Then on the death of the judge they again fall away. The principal judges are Othniel, Ehud, Deborah, Gideon, Jephthah, and Samson. It was probably composed about the 8th century B.C.

Judgment, the sentence of the law pronounced by a court of competent jurisdiction upon the matter in the record, and the remedy prescribed by law for the redress or punishment of injuries, the suit or prosecution being the course of proceeding by which the question is brought before the court. Judgments are either interlocutory or final. Interlocutory judgments include all those which are given on the *prima facie* state of the case as brought before the court, and which do not go to the absolute

merits of the case, such as judgments on application for injunction. But the largest class of interlocutory judgments are those which do decide the rights as between the parties, but require some other proceeding to determine the amount to be recovered, and usually a writ of inquiry directed to the sheriff, who impanels a jury for the purpose of assessing the amount of damages. If, however, the suit is for a specified thing or sum, the decision of the court determines it in the first instance, and it is final except as to any point of law which may have been reserved for discussion in the full court or "in banco" in legal phraseology.

Judicial Separation, as between husband and wife, now takes the place of the divorce *a mensa et thoro* (from bed and board). It is decreed on the petition of either husband or wife, and has all the effect of the old divorce referred to. It is decreed on the ground of adultery or cruelty, or on the ground of desertion without cause for two years or upwards, and during its continuance the wife acquires as to property, and for many other purposes, the condition of a *feme sole*. If granted on the wife's petition, an order may be made for alimony to the wife, and also for the custody, maintenance, and education of the children; and, on a decree of divorce or judicial separation for adultery of a wife entitled to any property, an order may be made with regard to a settlement thereout for the innocent party and for the children of the marriage. No judicial separation can be decreed if the petitioner (whether husband or wife) has been accessory to, or connived at, or has condoned the adultery; or if the petition is presented or prosecuted by collusion; and the court is not bound to decree the separation if the petitioner has been guilty of adultery during the marriage, or of cruelty, or of desertion, or wilful separation, or of such wilful neglect or misconduct as has conduced to the adultery, or if there has been undue and unexplained delay in presenting the petition. [ADULTERY, DIVORCE.]

Judith, the heroine of an apocryphal book of that name, in which she is described as killing Holofernes, a general of Nebuchadnezzar, King of Nineveh (*sic*), at the Siege of Bethulia. She is an ideal type of heroism, devoid of scruple and unburdened with natural feeling—another Jael. The book cannot be regarded as historical, and some have regarded it as a romance symbolic of the fortunes of the Jewish nation.

Judson, ADONIRAM (1788–1850), an American Baptist missionary, was born at Malden, Massachusetts. Having passed through a theological training he went to India in 1812, and soon proceeded to Burmah, where he lived first at Rangoon and afterwards at Ava, being imprisoned at the latter place during the war. He soon acquired a competent knowledge of Burmese, into which language he translated the New Testament. He afterwards compiled a Burmese-English dictionary. He died on his way to Mauritius. Judson's first wife wrote a History of the Burmese Mission; his third was Fanny Forrester.

Juggernaut (JAGANATHA, "LORD OF THE WORLD"), or PURI, a town on the south coast of

Orissa, Bengal Presidency, situate between the delta of the Mahanadi and Chilka Lake. It is celebrated for its temple of Vishnu, or Jagannath, as he is here called. Twenty-four festivals are held annually in honour of the Hindu god, attended by many thousands of pilgrims who bring rich offerings. At one of these he is dragged on a high car with sixteen large wheels to his house on the coast. It had been stated by many Christian writers that worshippers had been accustomed to throw themselves by hundreds before the car, which passed over their bodies, and this celebration has until recently been pointed to as a glaring instance of heathen superstitious barbarity; but H. H. Wilson and Sir W. Hunter have shown that the worship of Juggernaut does not involve the voluntary sacrifice of human beings.

Jugurtha, king of Numidia, the country which corresponds to what is now Algiers, Tunis, and Tripoli, was an illegitimate son of Mastanabal, who shared with his two brothers, Micipsa and Gulussa, the kingdom that had been held by Masinissa (q.v.). Jugurtha passed his youth with the Roman army under Scipio Africanus the younger in Spain. On the death of Micipsa, his uncle (118 B.C.), by whom he had been adopted, Jugurtha was called to share the government with Adherbal and Hiempsal, Micipsa's sons; but his ambition led him to claim the whole kingdom. Hiempsal was assassinated, and Adherbal driven out of the country. The latter appealed to the Romans, but Jugurtha's envoys succeeded by bribery in obtaining for him the western and more fertile part of Numidia. Jugurtha, however, did not respect the settlement, and put his cousin to death at Cirta. In 111 B.C. Rome declared war against Numidia, but Jugurtha bribed the consul Calpurnius Bestia into according him an advantageous peace; although, however, the former appeared at Rome to justify his conduct, the treaty was disavowed. Nevertheless, Jugurtha defeated Spurius Albinus and drove all the Romans out of his territory, and even when Metellus was placed in command no very decided success was gained over him. At length, however, the military skill of Marius and the diplomacy of Sulla, aided by the treachery of Bocchus, who betrayed his son-in-law into an ambush, the war was brought to a close, and 104 B.C. Jugurtha was led in triumph to Rome, where he perished in the prison beneath the Capitol. The Jugurthine War, an account of which was written by Sallust, was remarkable not only for the ability shown by Jugurtha and the later Roman generals, but also as being an important episode in the political history of Rome.

Jujube, a name now applied to a confection of gum and sugar, sold in small cubes as lozenges, in imitation of those formerly made for pectoral complaints with a decoction of the fruits of *Zizyphus vulgaris* and *Z. jujuba*, tropical and sub-tropical trees belonging to the buckthorn family. These fruits are still used as dessert.

Jujay, the name of the northern province of the Argentine Republic, as also of its capital, and the river on which the latter stands. Wheat and the

sugar-cane are grown, and the province has large but only partially developed mineral resources. Cattle, fruits, and chicha brandy are exported to Bolivia.

Jukagirs, a nearly extinct people of North-East Siberia between the Lena, Indigirka, and Kolyma rivers, and in the New Siberian Archipelago, remnant of a large family which included the Omoki, Shelagi, and many others. Not more than twelve persons still speak the Jukagir, which appears to be a stock language, unrelated either to the Mongolo-Tatar or to any other linguistic family. The Omoki were fishermen on the coast, the Shelagi reindeer nomads, and the collective national name of all was Andon Domni, or Odul-pa ("Men"). The type appears to have been quite different from the Mongolic, and more like the European—the features being long and regular, the nose straight, the cheekbones but slightly prominent, and the complexion almost white, especially amongst the women. (Schiefner, *Die Sprache der Jukagiren*, in *Bulletin de l'Académie de St. Petersburg*, vol. xvi.)

Jukes, JOSEPH BEETE (1811–69), an able geologist, was born near Birmingham, and graduated at Cambridge in 1836. While at the university he studied under Sedgwick, and in 1839 was appointed geological surveyor of Newfoundland. In 1842, two years after his return to England, he went as naturalist to the Australian exploring expedition, and published a *Narrative of the Survey Voyage of H.M.S. Fly* in 1847, after its close. In the same year he was attached to the British Geological Survey, and in 1850 became local director in Ireland. He was a Fellow of the Royal Society, and professor at the Dublin College of Science, and was author of a *Student's Manual of Geology*, and other works.

Julia, daughter of Augustus by his wife Scribonia, was born in 39 B.C. She was married as a child to Marcus Claudius Marcellus, and on his death to Vipsanius Agrippa. Her misfortunes began when she was induced to take as her third husband Tiberius, who was afterwards emperor. By him she was banished first to Pandataria, and afterwards to Rhegium, where she died in great distress in A.D. 14. Tiberius had some ground for his action in her infidelity, but the hatred borne her step-daughter by Livia was the main cause of her persecution. Of her children by Agrippa two sons died in youth, and a third was put to death by Tiberius. Her daughters were Julia, who was banished by Augustus for adultery, and Agrippina, who died in exile in Pandataria.

Julian (FLAVIUS CLAUDIUS JULIANUS), a Roman emperor known in history as "Julian the Apostate," was born at Constantinople in 331. His father, Julius Constantius, the brother of Constantine, was put to death, together with most of his kinsmen, by the sons of Constantine in 337. Julian and his brother Gallus were alone spared, the fate of the latter also being deferred for the time only. Julian was brought up a Christian, but under the influence of the rhetoricians soon became a philosophical pagan. His youth was spent in retirement at different places in Asia Minor, but

after the execution of Gallus in 354 he was confined at Milan. By the favour of the Empress Eusebia he was allowed to go thence to pursue his studies at Athens, and in the same year, 355, he was summoned to Milan, married to Helena, sister of Constantius, and appointed governor of Gaul, with the title of Cæsar. In the administration of that province the young student showed remarkable and unexpected powers. The Alemanni were defeated at Strasburg, and the other invaders of Gaul were subdued, the cities they had laid waste were rebuilt, and the burdens of taxation were lightened as much as was possible. So successful had been Julian's administration that the jealousy of the Emperor Constantius was awakened. When, however, an attempt was made to weaken him by the withdrawal of some of his best legions, the army of Paris resisted, and forced Julian to accept the title of Augustus. The troops now advanced towards Constantinople to fight the matter out with Constantius; but in the following year he died, and Julian was sole emperor. He had previously declared his adherence to the old religion, and now issued an edict of toleration. Nevertheless, he indirectly favoured the worship of the old gods to the full extent of his power. The soldiers, on taking the oath of allegiance to the emperor, were at the same time obliged to throw incense upon the altar. While at Constantinople in 361-2 the emperor swept away many abuses. He then proceeded to Antioch, whence he was to start on his campaign against the Persians. Here he was unpopular, and was lampooned by the city wits, to whom he replied by a curious satire on their effeminacy, in which he handles his own character with great freedom. After passing the winter at Tarsus he marched through Mesopotamia, and after defeating the Persian army near Ctesiphon, crossed the Tigris. He was now induced by treacherous promises to march into the desolate interior in the midst of the hot season. His army was surrounded by the Persians, many of whose attacks were repulsed, but in one of them (June, 363) Julian was mortally wounded, and is said to have died crying—"Vicisti Galilæe!" He is also described by Ammianus Marcellinus as addressing his officers in a noble Socratic speech. Julian was at once a soldier, a student, and an administrator. He had something both of the Greek and the Roman in his temperament. He had the rhetorical turn of the former, and the private and civic virtues of the days of the republic; but he had little dignity, and his philosophy was largely mingled with superstition. He was particularly addicted to the practice of divination. Christian writers, like Gregory Nazianzen and Chrysostom, denounced him with great ferocity, but his love of truth and the purity of his life have been judged by cooler heads to have been unimpeachable. Julian's chief work, his treatise against the Christians, is lost, but his *Letters*, *Orations*, and *Satires* are extant.

Julien, STANISLAS AIGNAN, originally Noel (1797-1873), French Chinese scholar, was a native of Orleans. His father, a mechanic, wished him to become a priest, but his linguistic tastes soon

became apparent, and his ability was recognised by his appointment in 1821, assistant professor of Greek at the Collège de France. The lectures of Abel Rémusat, however, soon attracted him to the study of Chinese, which he acquired with such rapidity that at the end of two years he published a Latin translation of part of one of the nine classical books of China (*Meng-tse*). In 1827 he became sub-librarian to the Institut de France, and in 1832 succeeded Rémusat in the chair of Chinese at the Collège de France, of which in 1841 he was appointed *administrateur*. In 1839 he also became joint-keeper of the Académie Royale. He translated many Chinese tales and dramas, compiled for the Ministry of Agriculture a *résumé* of the Chinese treatises on the cultivation of the mulberry, and in addition to a Chinese grammar published *Voyages des Pèlerins Bouddhistes*, and a rendering of the work of Laow-tsze, founder of the Taon religion. His *Histoire et Fabrication de la Porcelaine Chinoise* is a classic. He was a Sanskrit and Pāli scholar of some eminence.

Julius I., Pope of Rome from 337-352, supported Athanasius against the Arians, but was unable to overcome the opposition of the Eastern church.

Julius II. was born near Savona in 1443, being a nephew of Sixtus IV. His name was Giulio della Rovere. He was educated by the Franciscans and became Bishop of Carpentras and Cardinal in 1471. He afterwards held the archiepiscopal see of Avignon and several bishoprics, and was Papal Legate in France from 1480 to 1484. He acquired great influence in the College of Cardinals, but was defeated by Roderigo Borgia in his candidacy for the Papacy in 1492. He incited Charles VIII. to the conquest of Naples, and was unanimously chosen Pope in 1503. For ten years he occupied the Papal see, during which time he reconciled the Orsini and Colonna; formed a league against Venice with France, the Emperor, and Ferdinand of Aragon, but afterwards joined the Republic against his late allies; formed the Holy League against France, and convened a general council. He died of fever in 1513. Julius II. was the patron of Raffaele and Michelangelo; but his great ambition was to increase the temporal power of the Papal States and to aggrandise his own family.

Julius III. (GIAN MARIA DEL MONTE) was born at Rome in 1487, was created cardinal in 1536, and after taking a leading part at the Council of Trent, succeeded to the Papacy in 1550. He died in 1555, having been remarkable since his election for nothing except his personal magnificence and his patronage of the Jesuits. Under him England was temporarily reconciled to the Roman see.

Jullien (originally JULIEN), LOUIS ANTOINE (1812-60), the well-known conductor, was born at Sisteron, Basses Alpes, his father being a band-master. He studied composition without success under Halévy, and left the Paris Conservatoire in 1836 to begin his career as conductor. In 1838 he was for the first time insolvent, and in 1840 first appeared in London, where he conducted concerts at Drury Lane. In December, 1842, he began an

annual series of concerts which lasted till 1859. He popularised music by means of large bands, immense orchestras, the engagement of the best performers, and by great tact in the introduction of classical pieces. A special feature of these concerts were monster quadrilles composed by himself for the occasion. In 1848 he again became bankrupt in spite of his great success, and the year before his death was imprisoned for debt at Clichy. In 1856, when Covent Garden Theatre was destroyed by fire, he lost the whole of his music.

July, the name of the seventh month in the Julian and modern calendars, and the fifth in the old Roman calendar. It had originally 36 days, but the number was reduced first to 31, then to 30, and finally the number was made 31 in the calendar authorised by Julius Cæsar, in honour of whom the old name *Quintilis* was changed to *Julius*. The sun leaves Cancer and enters Leo during this month. It is celebrated for the "July Revolution," when Charles X. of France was set aside and Louis Philippe made king.

Jumièges, ROBERT OF (Robert Champart), a Norman who came to England with Edward the Confessor, and became Bishop of London and Archbishop of Canterbury (1050-2). Having opposed the national party, he was deprived of his see by the Witenagemote on the return of Godwine in 1052, and he passed the rest of his life in the abbey of Jumièges, near Rouen, whence he had originally come. He died there in 1052. WILLIAM of Jumièges, another monk of the same house, wrote a Latin history of the dukes of Normandy, which contains an account of the conquest of England.

Jumna (JAMUNÁ), the chief tributary of the Ganges, rises in the Himalayas in the State of Gurhwál, and flows in a south-easterly direction through the North-West Provinces, and after a course of about 700 miles enters the Ganges at Allahabad. Agra and Delhi are the chief towns on its banks. Its waters are used for irrigation purposes by means of the eastern and western Jumna canals. Its banks are high and its stream clear, but it is of little use for navigation in the greater part of its course during the hot season. It is nearly 11,000 feet above the sea-level at its source, but descends into the plains at an altitude of about 1,200 feet.

Jumpers, small maggots found in cheese, bacon, etc. They are the larvæ of a small black fly, which is the size of a common house fly, but is more slender in form. Its name is *Prophila casei*, Linn.

Jumping, in *athletics*, is divided into two classes—the *high jump* and the *long jump*. The record for the *latter* is 23 ft. 6½ in., for the *former* 6 ft. 5½ in.

Jumping Hare (*Pedetes caffer*), an African rodent of the same family as the Jerboa (q.v.). It is about the size of and coloured like the English hare, but the hind limbs are enormously developed, and it can cover from 20 feet to 30 feet at a bound.

June, the name of a month; according to the old Roman calendar the fourth, according to the Julian and Modern the sixth. It contained 26 days origi-

nally, which was made 30 by Romulus, 29 by Numa, and 30 by Julius Cæsar, and has continued with this number to the present day. The sun leaves the sign of Gemini and enters the sign of Cancer during this month. It is said to derive its name from Junius Brutus, Cæsar's friend and assassin.

Jung, JOHANN HEINRICH, who called himself Heinrich Stilling, a German of great versatility, was born at Grund, Nassau, in 1740, his father being a charcoal-burner. Having been a tailor and a schoolmaster, then a tutor, he went to study medicine at Strasburg in 1768. Here he made the acquaintance of Goethe and Herder, who encouraged his literary tastes. In 1772 he settled at Elberfeld as a surgeon, and attained great skill as an oculist. Six years later, however, he accepted a lectureship at Kaiserslautern, and in 1787 became a professor of economics at Marburg. In 1803 he came back to Heidelberg, but afterwards went to Carlsruhe, where he died in receipt of a pension from the Grand Duke of Baden in 1817. In 1777 "Stilling's Jugend," an account of Jung's boyhood, was published. He adopted the name from the Pietists (Die Stillen), whose doctrines he expounded in several works. His autobiography (translated into English in 1835), however, is his only work of permanent interest. Kant and Lavater were friends of the mystic.

Jung, SIR SALAR (1829-83), an Indian statesman of Arab extraction, succeeded his uncle, Suraj-ul-Mulk, as Dewan (or Prime Minister) of Hyderabad in 1853. He rid the country of the Arab mercenaries, reorganised the administration, and averted the annexation by the British which appeared imminent. In spite of the opposition of the people and the apathy of the Nizam, he prevented them from joining in the Mutiny. After the death of the Nizam in 1869, there was a regency, during which Sir Salar Jung could carry out his plans with a free hand. In 1876 he came to England with the object of recovering Berar, which had been ceded to the British for financial reasons; but though knighted and generally honoured, was unable to effect his purpose. He left Hyderabad a model state at the end of his thirty years' government.

Jungar (ZUNGAR), collective name of several historical Kalmuk (West Mongolian) peoples, whose original home was in Kulja. Since the 17th century they were divided into four branches: Chorass, Turgut, Khoshot, and Durbat, each with its own khan (chief), but all recognising the supremacy of the Chorasses. The Turguts, being oppressed by the other Jungars, migrated in 1636 westwards to the Lower Volga; but after the destruction of most of their oppressors by the Chinese in 1756, about 150,000 returned (1770) through the Khirghiz steppes to their old homes, losing half their number on the way. About 100,000 of these Turguts still survive in the Russian government of Astrakhan; but of all the other Jungars nothing now remains except Jungaria (Zungaria), the name of the region forming the heart of their empire, which, during the first half of the 18th century, stretched from Hami to Lake Balkhash. (Kouropotkine, *Les Confins Anglo-Russes dans l'Asie Centrale*, 1879, p. 14).

Jungermannia, a genus of liver-worts (q.v.), originally including almost all the large and varied order Jungermanniaceæ, which agree in bearing solitary sporogonia which usually split into four valves and contain both spores and elaters. It is now restricted to those leafy forms which are *succubous*, i.e. in which the front edge of each leaf is beneath the back edge of the succeeding leaf, and have a free and cleft *perigynæ*, or membranous envelope round each archegonium.

Jungfrau ("Maiden"), a mountain in the Bernese Alps on the border of the canton Valais in lat. 46° 32' N., and long. 7° 58' E. Its summit, which is 13,671 feet above the level of the sea, was first ascended in 1812 by the brothers Meyer.

Jungle, the name applied to the thickets of trees, shrubs, and reeds which are found in many parts of India, particularly at the southern base of the Himalayas and the mouth of the Ganges. The jungle is often impassable, and generally swampy and unhealthy. The jungle *flora* and *fauna* are very peculiar. Wild beasts, snakes, and monkeys abound in the jungle districts.

Jungle Fowl, *Gallus bankiva*, probably the original of our domestic breeds. Used also of other wild species of the genus. Wallace applies the name to *G. fuscatus*.

Juniper, a general name for the genus *Juniperus*, belonging to the cypress family among the Coniferæ (q.v.). It includes about twenty-five species of evergreen aromatic shrubs or small trees native to the cold and temperate regions of the northern hemisphere, and represented in a fossil state in Tertiary rocks. The leaves are usually small, acicular, and in decussate whorls of three. The flowers are dioecious, the male ones consisting of several anther-scales, each bearing three or six pollen-sacs, and the female ones of two or three whorls of scales bearing ovules singly at their base. These scales become fleshy and fuse into the fleshy so-called "berry" or *galbulus* of a red or purple colour. There are large oil-glands on the surface of the seeds. *J. communis*, the common juniper, a native of Britain and other northern countries, yields the diuretic berries used for flavouring gin, which derives its name from *genièvre*, the French for juniper. *J. Sabina*, the savin, a poisonously powerful emmenagogue, is used medicinally (and especially clandestinely) to procure abortion. The larger *J. bermudiana*, and the more abundant *J. virginiana*, the "red cedar" of the United States, are largely used for making cigar-boxes, cedar-pencils, and cabinet work.

Junius, the signature of a number of letters by an unknown writer, which appeared in the *Public Advertiser*, edited by Henry Woodfall, from January 21st, 1769, to January 21st, 1772. Soon after he began to write he attracted attention by his knowledge of and attacks on eminent men, amongst whom were Lord Granby, the Duke of Grafton, George III., and many others. The authorship has been attributed to as many as thirty-seven different people, including Sir Philip Francis, Burke, Barré, Wilkes, and Horne Tooke, but the evidence is in no

case conclusive. Whoever he was he did not write for pecuniary gain, as he waived all claim to the profits of his work. The first edition of his letters appeared in 1812. Many works have been written trying to prove who their author was, the most important of which were John Taylor's books: *A Discovery of the Author of the Letters of Junius*; (1813), and *The Identity of Junius with a Distinguished Living Character Established* (1816). These distinguished letters were the forerunners of the leading articles of to-day, which bear so important a part in politics.

Junk. 1. Any remnants or pieces of old cable, used on board ship for making gaskets, mats, points, sennits, etc. 2. A Chinese or Japanese native vessel of burden, usually with three masts and with a short bowsprit fitted on the starboard bow. The shrouds are sometimes only on the windward side. The fore and mainmasts generally have lug-shaped sails made of bamboo; the main-mast has also a cotton top-sail; the mizen, a cotton gaff-sail; and the bowsprit, a jib and sprit-sail.

Junker, WILHELM, the German explorer, was born in Moscow. Having studied medicine in several German universities, he first went to Africa in 1874, when he visited Tunis and Egypt. During the years 1876-8 he penetrated as far south as the Kibbi in the course of his explorations of the Upper Nile. In the following year he went from Cairo to a point on the Welle-Makua or Ubangi River, situated in 22° 47' E. long. and 3° 13' N. lat. He spent about six years in Central Africa, being with Emin for some time, and got back to Egypt by way of Karagwe at the beginning of 1887. An English translation of his *Travels in Africa between 1875 and 1878* appeared in 1890.

Juno, the consort of Jupiter and queen of the gods. She was the protectress of women in general, and of wives in particular. She was worshipped first at Veii and afterwards at Rome, as well as throughout Etruria. She had a sanctuary on the Aventine Hill, and also a temple on the Capitoline, which contained the mint of which she was the guardian genius. Sacrifices were offered to her on their birthdays by women; and on March 1st she had a festival called Matronalia. She presided over all the periods and aspects of married life, and bore the names of Domiduca, Juga, Pronuba, Lucina in reference to each. The month of June, considered most auspicious for marriage, was originally Junonius. In her public capacity she was known as Curiatia or Populonia. Juno is equivalent to the Greek Hera, and Virgil borrows his conception of the Latin deity from Homer's Queen of Olympus.

Junot, ANDOCHE (1771-1813), one of Napoleon's least successful generals, was a native of Bussy-le-Grand, department of Côte d'Or. Having entered the army in 1792, he was present at the siege of Toulon in the following year. He then served in Italy with Bonaparte, whom he accompanied to Egypt, where he distinguished himself greatly and became general of brigade. He fell into the hands of the English on his way back to France, but was

soon released. For two years (1801-3) he was Governor of Paris, which position he again held in 1806. Next year he was sent to invade Portugal, where he gained his title of Duc d'Abrantes. After this, however, his career was a series of disasters: Vimiera, Convention of Cintra, Saragossa. After the Russian campaign he was made Governor of Illyria, as he was considered unfit for active service. He finally threw himself out of window and died from the effects of his wounds. He was a personal favourite of Napoleon and a good soldier, but was not given a marshal's bâton. The extravagance of his wife (*née* Laure Permon) also severely tried the Emperor's patience. The Duchesse d'Abrantes left voluminous memoirs and numerous novels. She died in distress at a hospital.

Junta, in Spain, the name given to a council for administrative or political purposes. When Napoleon organised the Kingdom of Spain under Joseph Bonaparte (1808), he summoned a convention under the name of a junta of 150 notables, of whom 90 assembled. When in a few weeks Joseph had to retire, a fresh junta was formed hostile to the French.

Jupiter, or JUPITER, the chief Roman deity, is a contraction of *Diovis-pater*, "the heavenly father." Thus in poetry the form *Diespiter* appears. He is the sky-spirit, and thus gives rain ("Jupiter Pluvius") and hurls thunderbolts ("Tonans," "Fulminator"). He is also the help of the Latins in battle ("Stator"), and the guardian of their treaties ("Fidius"). His chief temple stood on the Capitol, and was dedicated to Jupiter Optimus Maximus; but there were many others, among which was that sacred to Jupiter Stator at the Mucian gate. He is more distinctively Latin than most of the Roman deities, though in most respects he corresponds to the Greek *Zeûs*. Jupiter was invoked at the beginning of every undertaking by the Romans; and victorious generals offered up thanks to him and celebrated their triumphs in his honour. He revealed the future by signs in the sky and also by the flight of birds. The Ides of every month were sacred to him and rams were offered up to him on these days, as also at the beginning of every week. He was also the guardian of property, public and private, and as such protected boundaries. As prince of light, white was the colour sacred to him. [SATURN.]

Jupiter, one of the planets of our solar system, is second in brilliancy to Venus, unlike which, however, it is a "superior" planet, having its orbit outside that of the earth. It is about five times as brilliant as Sirius, the brightest of the fixed stars. The orbit of Jupiter is but slightly inclined ($1^{\circ} 19'$) to the ecliptic. Its average distance from the sun is 483 million miles; its distance from the earth varies from 369 to 576 million miles. The length of its year or period of revolution around the sun is 11.86 terrestrial years; its apparent year or *synodic period*, the time between successive conjunctions of the planet with the sun, is 399 days. Its diameter from pole to pole is 83,000 miles; its equatorial diameter is 88,200 miles, and the departure

from perfect sphericity much more marked than in the case of the earth. Its density is 1.38 compared with that of water, and its mass 316 times that of the earth. The length of its day, or period of axial rotation, is about 9h. 55m. The planet is a beautiful object when viewed with a telescope; it is probable that the markings are entirely due to its atmosphere, and that the actual surface of the planet is rarely visible. Jupiter has hardly yet cooled from the condition of incandescence, and it is only slightly solidified. It possesses eight satellites, four of which were discovered by Galileo when he applied the telescope first to the investigation of the heavens. The names given to these are Io, Europa, Ganymede, and Callisto; their distances from the planet vary from 262 to 1,169 thousand miles, and their orbits are almost circular. By means of these satellites the first observations of the velocity of light were made. The fifth satellite was discovered by Professor Barnard in 1892; the sixth and seventh by Professor Perrine in 1905; the eighth by Mr. Melotte in 1908.

Jura, the name of a range of mountains running through the western cantons of Switzerland and extending southwards into France. They are formed of several parallel ridges having a length of nearly 200 miles and a breadth of 30 miles in the south, where are the highest peaks—Moleson 6,588 feet, Tendre 5,538 feet, and Dole 5,509 feet. Between the ridges are long valleys. The Doubs and other smaller rivers have their source in this range.

2. A French department takes its name from the Jura range, which occupies its south-east portion. Cattle are reared in large quantities on the rich pastures, and corn and the vine are grown.

3. An island of the Hebrides, west of Scotland, lying between Islay and the mainland, from which it is separated by the Sound of Jura. The island, which is 24 miles long and 8 broad, is very mountainous, the highest peak being 2,700 feet high. Very little of the soil is cultivated. There is a deep inlet in the west called Loch Tarbert.

Juraks, one of the main divisions of the Samoyede race, whose domain stretches along the Siberian seaboard from the Obi to the Yenisei. Two groups: *Primorskié*, those of the coast, and *Karasinskié*, those of the interior, numbering altogether scarcely 300. They dwell in tents, and still practise pagan rites, thrusting bits of raw meat into the mouths of their idols, a reminiscence of human and animal sacrifices. Type and speech not perceptibly different from those of the European Samoyedes (Seeböhm, *Journey to the Rivers Obi and Yenisei*, in *Proceedings of the Royal Geographical Society*, 1878).

Jurassic, the name now generally applied to the great series of Mesozoic rocks intermediate in age and position between the Triassic (q.v.) and the Cretaceous (q.v.), from their development among the Jura Mountains. They were termed Lias (q.v.) and Oolite by William Smith, but are so variable lithologically that no such names are desirable. In England they come to the surface between Dorsetshire and the Tees, and have been proved deep down under the south-east counties. They consist

mainly of thick, blue marine clays forming valleys largely occupied by grass-land, with interstratified harder limestones and sandstones, forming sometimes long bold escarpments, such as the Cotteswold Hills, and yielding much useful freestone for building purposes and some iron-ore and coal. The fossil plants are largely gymnosperms (q.v.), cycads, araucarias, arbor-vitæ, and true pines abounding and forming beds of jet (q.v.), lignite-rafts, or even coal. Corals abound in the limestones, which have often an oolitic texture, the most characteristic genera being *Isastræa*, *Thamnastræa*, and *Thecosmilia*. Crinoids, such as *Ectocrinus* and *Apio-crinus*, and still more the echinoids, such as *Cidaris*, *Clypeus*, *Pygaster*, and *Echinobrissus*, are also abundant, and sometimes form whole beds, as do also the brachiopods *Rhynchonella* and *Terebratula*. Pelecypods are more numerous than in any preceding age, oysters (*Ostræa*), with the sub-genera *Gryphæa* and *Exogyra*, scallops (*Pecten*), the related *Lima*, and *Trigonia* being specially characteristic. Cephalopods are represented by hundreds of species of *Ammonites* (q.v.), occurring in clays and limestones alike, and numerous *Belemnites* (q.v.). Lobsters and prawns are the prevailing crustacean types, and dragon-flies, may-flies, grasshoppers, and perhaps a butterfly, represent the insects. Ray-like cartilaginous fishes with crushing teeth, such as *Acrodus* and *Pycnodus*, and ganoids, were not uncommon; but reptilian life was at its acme of development. Besides the earliest true turtles, numerous lizards, and crocodiles such as *Teleosaurus* and *Goniopholis*, occur, with the extinct groups including *Ichthyosaurus* (q.v.), *Plesiosaurus* (q.v.), *Pliosaurus*, the flying pterodactyls (q.v.), and some of the gigantic terrestrial Dinosauria (q.v.), such as *Compsognathus*, *Megalosaurus*, and *Atlantosaurus*. The oldest known fossil bird, *Archæopteryx*, and some fifteen genera of rat-kangaroos from two widely separated horizons, complete the series. The Jurassic series has been subdivided as follows, most of the divisions being named from their English development, and many of them being described separately:—

UPPER OR WHITE JURA (Malm).	Maximum thickness in England. Feet.
<i>Upper or Portland Oolites.</i>	
Purbeckian, partly fresh-water, with <i>Ostræa distorta</i>	360
Portlandian, including Bolonian below.	
Portland Stone, with <i>Ammonites gigas</i>	70
Portland Sands	150
Kimeridgian, or Kimeridge Clay with <i>Exogyra virgula</i>	600
<i>Middle or Oxford Oolites.</i>	
Corallian (with Sequanian above), with <i>Cidaris florigemma</i>	250
Oxfordian or Argovian, with <i>Trigonia clavelata</i>	600
Callovian or Kellaways Rock, with <i>Ammonites calloviensis</i>	600
<i>MIDDLE OR BROWN JURA (Dogger).</i>	
<i>Lower or Bath Oolites.</i>	
Bathonian, including Cornbrash, with <i>Echinobrissus orbicularis</i>	40
Forest Marble	450

Great or Bath Oolite, with <i>Terebratula maxillata</i> , with Bradford Clay, with <i>Apio-crinus rotundus</i> and <i>Waldheimia digona</i> , and the Stonesfield Slate below	130
And Fuller's Earth, with <i>Ostræa acuminata</i>	150
Bajocian or Inferior Oolite, named from Bayeux, with the lower part of the Northampton Sands and the Yorkshire coal-bearing "dogger"	270

LOWER OR BLACK JURA (Lias).

Toarcian, named from Thouars, or Upper Lias	400
Middle Lias, Marlstone, or Liassian	200
Sinemurian, or Lower Lias, Hettangian or Infra-Lias, with <i>Ammonites angulatus</i> and <i>planorbis</i>	900

The Jurassic series is generally conformable both to the Triassic below and to the Cretaceous above.

Jurchen, a historical Mongolic people, probably of Manchu stock, who ruled over North China (Kin, or "Golden" Dynasty) till their overthrow by the Mongols. The Jurchens originated the pigtail fashion, which was at first a badge of servitude, but which after 1627 became an honourable national trait amongst the Chinese, though never adopted either by their Manchu or Mongol rulers. Specimens of the Jurchen language are preserved in the collections prepared for the use of the Interpreters' College, Peking, where it appears to have been studied till the year 1658.

Jurisdiction. This term is derived from the Latin word *jurisdictio*, which signifies the "declaration of *jus* or law." He who had *jurisdictio* was said "*jus dicere*" to "declare the law." The whole office (*officium*) of him who declared the law was accordingly expressed by the word *jurisdictio*. Jurisdiction in England means an authority which a Court of Law or Equity has to decide matters that are litigated before it, or questions that are tried before it. The Supreme Court of Judicature has jurisdiction over all England and Wales; but the jurisdiction of other courts is limited to certain territorial space and to certain kinds of business or matters in dispute. When the jurisdiction of a court extends all over the Kingdom it may still be restricted to certain causes which it is empowered to try. If proceedings be commenced against anyone before a court which has no jurisdiction in the matter, the defendant may answer by alleging that the court has no jurisdiction, which is termed pleading to the jurisdiction. When anyone has been convicted by a court having no jurisdiction, the proceedings may be moved into the King's Bench division of the High Court by the writ of certiorari and quashed. [CERTIORARI.]

Jurisprudence, from the Latin *jurisprudentia*, which signifies a "knowledge of law." Jurisprudence indicates more than being simply acquainted with the rules of law as they exist in any given system. It means such an acquaintance with them as implies a knowledge of the law as a whole or system, a knowledge of the several parts, of their relation to one another and to the whole. The Roman *jurisprudentes*, who were writers on law, gave to the several rules of law which related to any given division of the whole matter a certain order and consistency. They developed and

explained and arranged that which existed as an incoherent mass. Their influence on the development of law was great, both directly and indirectly, and the compilation of Justinian called the "*Digest*" or "*Pandect*," entirely composed of extracts from the writings of the Roman Jurists, gave to their opinions the force of law in the Roman Empire. Jurisprudence, generally, is conversant about those principles which are inseparable from all systems of law, or common to all systems of law; for, however systems of law may differ in fact, and however much they may appear to differ in form, there are fundamental principles which are common to all. The notion of possession, of property, of most of the ordinary contracts of life, of testaments, of intestacy, and the like, are essentially the same. The notions of person, natural and artificial, of right, of duty, and many other things, are universal and necessarily the same. It is the business of general jurisprudence to explain all these common notions, and to reduce the whole matter to one general form or system with which all particular systems of positive law may be compared. This has been done in various ways by different writers; but the best examples are by the German writers on law. When general jurisprudence becomes a regular part of a law student's education, it will lead to a more comprehensive study of our own law, to a more correct conception of its parts and their relations to one another, and, consequently, to a nearer approximation of the particular law of England to the true measure or standard of general law in those cases in which our particular system deviates from it. The study of general jurisprudence would be a sure, though a slow, corrective of many of the evils under which our existing society suffers.

Jury is an assembly of men authorised to inquire into and to determine on facts, and bound by an oath to the faithful discharge of their duty. The etymological derivation of the term is obviously from *jurō*, "to swear," whence we find this institution called in low Latin *jurata*, and the persons composing it *jurati*; in French, *les jurés*; and in English, *the Jury*. In England, when the object is inquiry only, the tribunal is sometimes called an inquest or inquisition, as in the case of a grand jury or coroner's inquest; but, when facts are to be determined by it for judicial purposes, it is always styled a jury. When the trial by jury is spoken of at the present day it signifies the determination of facts in civil or criminal justice by twelve men sworn to decide facts truly according to the evidence produced before them. In the County Courts a jury consists of five only. Inquiry into facts on behalf of the Crown by means of juries was common in England long before the trial by jury was constituted for judicial purposes. The juries now in use in England are a grand jury, a petty or common jury, and a special jury. A grand jury is exclusively incident to a court of criminal jurisdiction. Its office is to examine into charges of crimes brought before them at assizes or sessions, and if satisfied that they are true, or at least that they deserve more particular examination, to return a bill of

indictment against the accused, upon which he is afterwards tried by the petty jury. A grand jury must consist of twelve persons at the least, though in practice a greater number are usually summoned, but twelve must always concur in finding every indictment. Until the end of the 13th century the only qualification required for petty or common juries for the trial of issues in criminal or civil courts was that they should be "free and lawful men"—*freemen* as holding by free services or free burgesses in towns, and *lawful* men, that is, persons not outlawed, aliens, or minors, but entitled to the full privileges of the law of England. The statute 6 George IV., c. 50, entirely remodelled the law respecting juries. By this statute every man (with certain specified exceptions between the ages of 21 and 60 years) who has within the county in which he resides £10 a year in freehold lands or rents, or £20 a year in leaseholds for unexpired terms of at least 21 years, or who being a householder is rated to the poor rate in Middlesex on a value of not less than £30 and in any other county of not less than £20, or who occupies a house containing not less than fifteen windows, is qualified and liable to serve on juries in the superior courts, and also to serve on grand juries at the sessions of the peace and on petty juries at the sessions of the county in which he resides. By the "Jurors Act, 1870," aliens domiciled here for ten years or upwards may be jurors if otherwise qualified, and convicts (unless after pardon) are disqualified. For the several classes of persons exempted from serving on juries see the comprehensive schedules to the Act, which include peers, members of Parliament, judges, clergymen, and other ministers of religion, barristers-at-law, certificated conveyancers, and special pleaders if actually practising, solicitors and their managing clerks, officers of courts, physicians, surgeons, if in actual practice, and many others. Special jurors are composed of such persons as are described in the Jurors' Book as esquires and persons of higher degree, or as bankers or merchants. A special jury may be obtained at the instance of either party. There is no statutory remuneration for common jurors. Special jurors are entitled to one guinea per cause under an Act passed in the reign of George IV. After the jury have appeared, and before they are sworn, they are liable to be *challenged* by either party, such challenges being of two sorts—(1) to the array, or (2) to the polls. A challenge to the array is an exception to the whole panel or list of jurors returned for some partiality or default in the sheriff or under-sheriff by whom it has been arrayed. Challenges to the polls are objections to particular persons either on the ground of incompetency, insufficient qualification, or of bias or partiality, or of infamy, as having been convicted of some infamous crime. Upon these challenges the cause of objection must in each case be shown to the court, which decides thereon. One of the jury is appointed foreman, and (after hearing the case and the judge's summing-up) he generally pronounces the verdict of the jury to the judge in court.

Jury Mast, a temporary mast erected to

replace one that has been lost in action or bad weather, or put into a new ship so that she may be navigated to a place at which she can be properly fitted. The term is also applied to a light permanent mast placed in a vessel that is intended to remain in harbour.

Jussieu, ANTOINE LAURENT DE (1748-1836), the most celebrated of a family of French botanists, was born at Lyon. His father and his uncle Bernard, under whom he was trained, were botanists of repute, but Laurent surpassed them. After having been in charge of the Paris hospitals, he was from 1770 to 1826 professor at the Natural History Museum. His *Genera Plantarum*, published in the year of the Revolution, is the basis of the modern classification of plants. His son Adrien (1797-1853) succeeded to his professorship, and was the author of an elementary treatise on botany, as well as the teacher of the rising generation. [BOTANY.]

Justice, COURTS OF. JUDICATURE ACTS. The superior Courts of Justice, prior to the passing of the "Judicature Acts, 1873-75," consisted of the Courts of Chancery, Queen's (now King's) Bench, Common Pleas, Exchequer, Admiralty, and Probate and Divorce. The jurisdiction of all these were by the above Acts transferred to and became vested in the High Court of Justice, so as to effect a union and consolidation of these courts, and the London Court of Bankruptcy has since been added thereto as a division of the High Court, and all these courts therefore now constitute (in conjunction with the Court of Appeal, newly established by such Acts) one single supreme tribunal wherein is administered both law and equity; so that if any plaintiff, petitioner, or defendant shall advance an equitable claim or defence, such relief is now given therein as theretofore given by the Court of Chancery, and so that all legal claims, demands, and liabilities existing by common law, custom, or statute, are recognised and given effect to therein as theretofore by any of the above-mentioned courts. A short summary of the jurisdiction of the several courts now amalgamated as above is all that our limited space will admit of.

1. *The Court of Chancery*, otherwise called the *High Court of Chancery*, always deemed in matters of Civil property the most important of any of the superior Courts of Justice, was the principal court in which that part of the law of England known as Equity was enforced, and it is said to have taken its name from the judge who presided over it, the Lord Chancellor. [EQUITY; CHANCELLOR.]

2. *The Court of King's Bench*, so called because the sovereign used formerly to sit there in person, whence the style of the court was *coram ipsa regina*, was the supreme Court of Common Law in the kingdom. Yet though the sovereign himself used to sit in this court, and still in contemplation of law is supposed so to do, he did not, neither by law is he empowered to, determine any cause or motion but by the mouth of his judges, to whom he is deemed to have committed his whole judicial authority. The jurisdiction of this court was very high and transcendent. It kept all inferior jurisdictions within the bounds of their authority, and

might even remove their proceedings to be determined before it or prohibit their further progress below. It superintended all civil corporations in the kingdom. It commanded magistrates and others to do what their duty required in every case where there was no specific remedy. It protected the liberty of the subject by a speedy and summary interposition. It took cognisance of both criminal and civil causes, the former in what was called the Crown side, and the latter in the plea side of the court. It enjoyed a general jurisdiction and cognisance over all actions between subjects, except matters affecting the revenue of the Crown and matters appertaining to the realty.

3. *The Court of Common Pleas* (otherwise known as the *Court of Common Bench*) took cognisance of all actions between subject and subject, including real actions and actions appertaining to the realty. This court was also in modern times entrusted by the legislature with an exclusive jurisdiction in election matters on appeal from the decisions of the revising barristers and in some other matters as under the Parliamentary Electors' Act, 1868, and the Corrupt Practices (Municipal Electors) Act, 1872. And from the judgments of this court proceedings in error lay primarily to the Exchequer Chamber and ultimately to the House of Lords.

4. *The Court of Exchequer* was at first intended principally to order the revenues of the Crown, and to recover the sovereign's debts and duties, though it afterwards acquired (by usurpation founded on a legal fiction) the additional character of an ordinary court of justice between subject and subject. The court is said to have derived its name from the chequered cloth (*Scaccarium*), resembling a chess-board, which covered the table there and on which certain of the king's accounts were made up, the sums being marked and scored with counters. It was formerly a Court of Equity as well as a Court of Common Law, but its equitable jurisdiction was taken away by a statute passed in the early years of the present reign. The judges were called *Barons*.

5. *The High Court of Admiralty* had jurisdiction to try and determine all maritime causes—that is, all injuries committed on the high seas—and, generally speaking, and with the exception of any case otherwise provided for by Act of Parliament, all causes so triable must be causes arising wholly upon the sea, and not within the precincts of any country.

6. *The Court of Bankruptcy*; 7. *The Court of Probate*; and 8. *The Court of Divorce and Matrimonial Causes*, will be found dealt with under their several titles in this work.

Such having been the several courts which were united and consolidated together into the High Court of Justice, it is now constituted a superior Court of Record, and to it is transferred the jurisdiction which, when the Judicature Acts came into operation, belonged to all and any of the several courts as already specifically mentioned: as also the common law jurisdiction which at the same time belonged to the Palatine Courts at Lancaster and Durham, and also the jurisdiction appertaining to such courts as are created by commissions of assize, of oyer and terminer, and of gaol delivery, or

by any of such commissions. The members, *i.e.* the judges, of the High Court of Justice consist of the Lord Chancellor, the Lord Chief Justice of England, the Master of the Rolls, and puisne judges, and the judges of the Court of Probate and Admiralty.

Justice, CHIEF. Two of the three superior courts of Common Law—*viz.*, the King's Bench and the Common Pleas—were formerly presided over by a chief, termed the "Chief Justice," and three or four puisne judges; so was the third court—the Court of Exchequer—but the Chief Justice of that court was designated "Chief Baron," and the puisne judges "Barons." Now that the Courts are amalgamated the title of Chief Justice appertains to the Chief Justiceship of the King's Bench Division only, who is a member or judge of the High Court. [JUSTICE, COURTS OF; EXCHEQUER.]

Justices of Peace are persons appointed to keep the peace within certain prescribed limits, for which they hold a commission from the Crown with authority to act judicially in criminal causes, and in some matters of a civil nature arising within their jurisdiction. The origin of justices of the peace, or magistrates, can be traced back to the time of Edward I., for by statutes passed in the early part of this reign it was directed that every county and town should be well kept, and that upon any robbery or felony committed therein *hue-and-cry* should be raised upon the felon, and they that kept the town were to follow him with hue-and-cry from town to town with all the town and the towns near, and, failing capture, the hundred was liable for the damage. In the reign of Edward III. conservators of the peace were appointed whose duty it was to assist the sheriff, coroner, and constable, and they were empowered to imprison and punish rioters and offenders. These conservators were afterwards designated justices of the peace. By a more recent statute of Queen Elizabeth's reign the sheriff or constable was required to make the pursuit both with horse and foot; and to the present day hue-and-cry in that manner may still be made under that and the previous statutes; but this is seldom, if ever, now made, owing to the effective, if not so speedy, remedy which is provided in the ordinary police and criminal processes for the apprehension and punishment of offenders. Justices of the peace are either appointed for particular counties or for boroughs. The former have been usually only appointed on the recommendation of the Lord-Lieutenants of the counties, the propriety of which has been recently debated in Parliament.

Justin Martyr, a Christian father of the second century, was born at Flavia Neapolis, now Nábulus, in Palestine. His parents appear to have been heathens. He himself was first a Stoic, then a Peripatetic, then a Pythagorean, and finally a Christian Platonist. Nothing is known of his life except what he himself tells, according to which he disputed at Ephesus with a Jew named Trypho, and at Rome with Crescens, a Cynic. Eusebius says that Justin owed his death to the hatred of the latter. His martyrdom was probably between

148 and 165, but the date of his birth cannot be fixed. The account of his death is derived from an old document of unknown authorship. Many writings are attributed to Justin, but very few are undoubtedly genuine. Of these the *First Apology* was dedicated to the Emperor Antoninus Pius. He defended the general position of the Christians rather than their particular doctrines.

Justinian I. (FLAVIUS ANICIUS JUSTINIANUS), Roman Emperor, was born in Illyricum about the year 483. His original name was Uprauda. He was educated in Constantinople, and adopted by his uncle, Justin I., who in the year of his death (527) associated him with himself in the empire. The great work of his reign was the so-called codification of the laws. By the *Codex Constitutionum* issued in 529, the statute law, consisting of the decrees, edicts, rescripts, etc., of the emperors were reduced and brought into order; and in 533 the *Digest* or *Pandects* gave a selection of extracts from Ulpian, Paulus, and some thirty of the other great jurists, no less than two thousand treatises having been consulted. By these all former statutes and legal opinions were abrogated. An elementary manual containing an outline of the laws based upon the *Commentarii* of Gaius, and known as the *Institutes of Justinian*, was also prepared; and in 534 a revised *Codex* was issued, this being the one now in use. In this work Tribonian had been the chief adviser of the emperor, and by him much of the work itself was done. The *Novellae Constitutiones*, or "Novels," embodying the decrees made in Justinian's own reign, completed the immense legal work, which is known in its entirety as the *Corpus Juris Civilis*. All but the "Novels" were published in Greek.

Foreign wars and theological strifes occupied the rest of Justinian's attention. As a theologian the emperor was orthodox, and was active in his suppression both of heathens and heretics. Under the influence of his wife, Theodora, however, he ultimately became involved in a species of Monophysitism, for holding which heresy he had deprived several bishops. He summoned Pope Vigilius to Constantinople in order to induce him to condemn certain writers of the orthodox party who were tinged with Nestorianism, and ejected Eutychius, the Patriarch of Constantinople, for resisting his views. He became involved in wars on account of his persecutions of the Montanists in Phrygia and the Samaritans; and by closing the schools at Athens drove the professors to the Persian Court. War with Chosroes, King of Persia, continued for twenty-two years, at the end of which the empire was weakened, and had to pay a tribute in exchange for the possession of Lazica. On the other hand, by the generalship of Belisarius (*q.v.*), northern Africa and southern Spain were reconquered from the Vandals, and the kingdom of the Ostrogoths in Italy was overthrown. In 536 Rome was taken, and when a revival of the Ostrogoths under Totila had shaken the imperial administration, Narses was despatched in 552 with a fresh army, by which the barbarian was defeated and slain at Taginae. Italy was reunited to the empire. Notwithstanding

these successes on the borders of the empire, the barbarians of the north were allowed to make frequent incursions, and sometimes to appear even under the walls of Constantinople.

In his administration Justinian had an eye to men of ability, but was not scrupulous as to their character and proceedings, so long as they served him well. Heavy taxes were imposed not only for the wars, but for the purpose of building, of which the emperor was very fond. The Church of St. Sophia (now a mosque) and that of Little St. Sophia (originally Saints Sergius and Bacchus) are memorials of his magnificence in this direction. During this reign the dignity of the consulship was abolished; and since the large expenses which its bearer was expected to support were defrayed by the state, a great economy was effected. Justinian himself was a man of great activity and talent, but fell short of being a great man, though he approached nearer to it than any other Eastern emperor. He had a great passion for theology; but it is unknown to what extent he took part in the great legal work of his reign. He was much under the influence of his wife. He died in 565, after a reign of thirty-eight years, and having no children, was succeeded by his nephew, Justin II.

Jute, the fibre of the two closely-related species *Corchorus capsularis* and *C. olitorius*, tall annual herbaceous plants belonging to the order Tiliaceæ, and native to Bengal, which is also almost the sole seat of their cultivation. They are grown in a hot climate with an abundant rainfall and in rich, well-manured alluvial soil, and the stalks are cut between August and October, preferably when the plants are in flower. The cost of cultivation ranges from 3s. to 52s. per acre, and the produce from 5 cwts. to 30 cwts. The fibre is obtained by a retting process, as in the case of flax and hemp (q.v.), and is 6, 7, or even 14 feet long, the finest being yellowish white, and having a silky lustre. It is more woody than either flax or hemp, and, though readily dyed, cannot easily be bleached to a pure white. It is exported from Calcutta in bales of 400 lbs. each, nine-tenths of that exported in the raw state coming to British ports. The exportation has grown from 18 tons valued at £62, in 1829, to several hundred thousand tons; the annual value of the exported manufactured jute being now something like £12,000,000, while the raw jute amounts to nearly the same sum. Jute is manufactured by the Hindoos into string, cord, paper, gunny-cloth and gunny-bags. The coarse sacking known as gunny-cloth was formerly made by hand; but there are now a number of jute-mills with power-looms in Bengal, the exportation of gunny-cloth now amounting to 15,000,000 yards. Gunny-bags were only first exported in 1883, but nearly 100,000,000 are now annually exported, chiefly to the United States and Australia. They are used for wool-packs and to hold salt, corn, and other seeds, and, when worn out, for paper-making. The failure of the supply of Russian hemp and flax during the Crimean War (1854-56), and of American cotton during the Civil War of 1861-63, established the manufacture of jute at Dundee, which is still the chief centre, though

there are also factories at Glasgow, Aberdeen, and Barrow-in-Furness, and in Ireland. There are now upwards of a hundred jute factories in the United Kingdom. Jute manufactures to the value of something like £2,000,000 are exported from the United Kingdom. This large manufacture has been mainly rendered possible by a process of softening the jute with oil and water. Otherwise it is spun in much the same manner as flax. It is used for sacking, tarpaulins, backing for floor-cloth, carpets, and rugs; as an adulterant of silk, and as an imitation hair in stage-wigs.

Jutland, a thinly peopled peninsula situated between the North Sea, the Baltic, and Germany. Its greatest breadth is upwards of 100 miles, and it is 300 miles in length. A low ridge of chalk hills run through it from south to north. It has formed part of Denmark since the 10th century, the Jutes having been previously its inhabitants.

Juvenal (DECIMUS JUNIUS JUVENALIS), the great Roman satirist, is supposed to have been born at Aquinum, the son of a freedman, probably in the reign of Claudius. He seems to have been in easy circumstances, and had had a good training in rhetoric. Some accounts say that he was banished to Egypt for having given offence by some lines originally written against the actor Paris, the favourite of Domitian, but by what emperor is quite uncertain. In an inscription found at Aquinum, recording the dedication of an altar to Ceres by a Junius Juvenalis, the latter is called "duumvir quinquennalis" and "flamen divi Vespasiani." Internal evidence points to the fact that the Satires were composed between 100 A.D. and 130 A.D. in the reigns of Trajan and Hadrian. They are generally held, however, to portray the state of society under Domitian. Of the sixteen Satires, the third (imitated by Johnson in his *London*), the tenth, and the sixth (against the female sex), are the most celebrated. The fourth is political rather than social. Juvenal was a friend of Martial, and a contemporary of Tacitus and the younger Pliny. He has an unrivalled power of invective, but is without the restraint of the great historian, or the imagination of a poet, or the urbanity of a Horace. His gift is rather rhetorical than poetical. Among the best editions of Juvenal are those of Otto Jahn, J. B. Mayor, and Lewis.

Juvenile Offenders. When children apparently under twelve years of age, or between the ages of twelve and sixteen years, are brought before justices charged with offences, the justices have power under the "Summary Jurisdiction Act, 1879," to deal summarily with such cases instead of committing the offenders to take their trial at the assizes or sessions. The justices are also empowered to send such offenders to a reformatory school for a certain fixed period, not less than two or more than five years.

Juxon, WILLIAM (1582-1663), Archbishop of Canterbury, was born at Chichester and educated at Merchant Taylors' and St. John's College, Oxford, of which he became president in 1621. He had previously held the benefices of St. Giles, Oxford,

and Somerton in the same county. He became successively Dean of Worcester, Bishop of Hereford, and Primate, this last after the restoration. In 1641 he resigned the office of Lord High Treasurer, which he had held for six years with credit if not with distinction. He was with Charles I. at his execution, and is perhaps best known to posterity as having been addressed with the mysterious "Remember!" by that unfortunate sovereign. He owed his rise to the friendship of Laud.

K

K, k, the eleventh letter in the English alphabet, derived from the Egyptian hieroglyphics of a bowl, called Kaph by the Phœnicians, and then by the Greeks Kappa; it was only used in Latin in Kalendæ and proper names, and therefore does not appear in Romance alphabets. This letter represents the sound of the back palatal voiceless stop or explosive formerly called the hard guttural mute. It is used for this sound in Modern English in words of early English or Romance origin before *e*, *i*, and *u*. It is never doubled, but is used with *c* for double *c* and double *k*. It is also used in the writing of the middle ages as a numeral for 250.

Kaaba, or CAABA, the name given to the Mohammedan mosque at Mecca, and sometimes to the small oratory within it, containing a black stone said to have been given by the angel to Abraham.

Kababish, *i.e.* "Goatherd," a large Arab tribe, East Sudan, chiefly along the west bank of the White Nile between 12° to 15° N. lat., and on the steppes bordering the caravan route running from Kordofan to the Nile at Dongola. They are akin but often hostile to the *Bakkara* ("Cowherds"), who dwell further south and along the Bahr el-Arab nearly to its source. Both are fanatical Mohammedans, hunters and robbers, devoting most of their energies to slave-raiding and plundering expeditions. Before the Mahdist revolt (1882) the Kababish were estimated at 60,000, divided into about forty sub-tribes. (Parkyns, *The Kubbabish Arabs*; *Journal of the Royal Geographical Society*, xx., p. 254.)

Kabards, a historical people of Central Caucasus (Great and Little Kabarda), said to have been originally Khazars, but through long alliances with the Circassians now completely assimilated to the Caucasian type of which they are at present the finest representatives; tall, handsome, with extremely regular features, haughty expression, and martial bearing, hence largely recruited for the household troops of the Czar; the superb "Cherkesses," mounting guard at the Winter Palace, Petersburg, are mostly Kabards. All are Mohammedans, except a small group which in 1763 became nominal Christians, and settled in the northern steppe about the middle course of the Terek. An opposite movement took place towards the beginning of the nineteenth century, when some 40,000, to escape from Russian oppression, took refuge with the Turks of the Kuban basin, where many of their descendants

still survive. The *Kabertai*, as they call themselves, speak one of the numerous stock languages of the Caucasus, noted for its harsh, guttural, and hissing sounds. At present the full-blood Kabards number altogether little over 30,000.

Kábul. [CABUL.]

Kabyles (Arab. *qabil* = "tribe;" plural *qabail*), the collective name of one of the chief divisions of the Berber race [BERBERS], who occupy the coast ranges and tablelands of Mauritania, and who call themselves Imazighen. Unlike the Arab nomads, the Kabyles are chiefly peasantry settled in villages with a communal organisation administered by an *amir*, whose office is elective and not hereditary like that of the Arab sheikh. In Algeria there are as many as 120 distinct tribes grouped in *thakebilt* ("confederacies"), some of which, such as the Ait-Írâten, the Igawawen (Zwawas, whence the French Zouaves), the Gueshtulas, and others, are of great antiquity, and were formerly very powerful. At present they number from 450,000 to 500,000 souls, all Mohammedans, but of a less fanatical type than their Arab neighbours. Since 1850 the Algerian Kabyles have been subject to France, while those of Morocco are for the most part still semi-independent, often revolting against the Sultan's authority, and paying tribute only under compulsion.

Kachari, a large Tibeto-Burman people, Goalpara and Garo districts, West Assam; seven main divisions: Hojai with Lalong, Mech, Koch, Rabha, Chutia, Tipperah, and Garo, all except the Garo more or less Hinduised; total population about 230,000. The original national name is *Bodo*; but those who have adopted the Hindu religion call themselves *Soronia*, *i.e.* "Purified." Some of their tribes are scattered over north-east Bengal as far as the Terai district, Nepal, where they take the name of *Mechi*. Kachari appears to be mainly restricted to the Assamese branch, who are a vigorous, industrious people, trustworthy and honest, altogether superior physically and morally to the average Bengalese peasantry. The primitive Kachari language is regarded by Hodgson as of a Dravidian type in its general structure. (Rev. S. Endle, *Outline of the Kachari Language*, 1885; G. H. Damant, *Journal of the Asiatic Society*, April, 1880.) The Kachari were subdued by the Burmese in the first quarter of the nineteenth century; but the Burmese were expelled in 1826 by the English, who restored their *raja*, and on his death in 1830 annexed the kingdom to the Bengal Presidency.

Kachinzes, a Tatar people of South Siberia, along the right bank of the Upper Yenisei between the Bielaia-Yussa and Abakan confluences. Since their reduction by the Russians, they have become nominal Christians and monogamists. Formerly great hunters, they are now occupied chiefly with stock-breeding, and own considerable numbers of horses, cattle, and sheep. The Kachinzes are one of the few Siberian tribes who are not dying out, having increased from about 1,000 at the end of the 18th century to over 7,000 in 1890. (Strumpell, *Die Katschinzen*, in *Mittheilungen* of the Leipzig Geographical Society, 1875.)

Kader, a low-caste tribe, Anamally Hills, Coimbatore, South India, one of the purest representatives of the aboriginal Negrito element, nearly black, with wavy hair and frizzly beard, hence quite distinct in type from the Dravidians, although they now speak a Malayalim (Dravidian) dialect. (Emil Schlagintweit, *Indien in Wort und Bild*.)

Kaffa, or FEODOSIA, a Russian seaport on the S.E. coast of the Crimea. It was founded in the 6th century B.C., under the name of Theodosia, by a body of Greek colonists from Ionia. During the Middle Ages it belonged to the Genoese, and formed an important depôt for Eastern goods. In 1474 it was captured by the Turks. Under their rule it carried on a thriving trade in Russian and Polish slaves, but in 1792 it fell into the hands of the Russians. Soap, caviare, and camel-hair carpets are manufactured.

Kafir (Arab. *Kāfir*, plural *Kufra*—"infidel," "unbeliever"), originally a term of contempt applied by Mohammedans to all pagan peoples who reject the tenets of the Koran; hence there are "Kafirs" in Asia (the Siah Posh of Kafiristan) and in North Africa (the heathen Tibbus from whom the Kufra Oasis was named). When the Portuguese penetrated into the Indian Ocean, they found the word, which they wrote "Caffre," current amongst the Arabs of Sofala and Zanzibar, with special reference to the pagan Negroid populations of the east coast. In this more restricted sense it passed from the Portuguese to the English, who have always applied it almost exclusively to the heathen peoples with whom they came in contact on the south-east seaboard (Caffraria, Kafirland) after their occupation of Cape Colony. The true name of most of these Kafirs is Ama-Xosa (Ama-Khosa), and they form, with their northern neighbours, the Ama-Zulu, a distinct and important division of the Bantu family. [ZULU-XOSA.]

Kafiristan ("Land of Unbelievers"), a little-known region on the N.W. frontier of India, inhabited by an Aryan race (Siáhposh), who speak a language akin to Sanskrit, and worship one Supreme Being (Imbra). The country, which is bounded on the W. and S. by Afghanistan, is intersected by numerous ridges, from 11,000 to 17,000 feet in height, mostly running from the Hindu Kush range on the N.W. The various tribes occupying the valleys between these are not apparently bound together by any political tie. The best authenticated accounts represent the Siáhposh Káfirs as bold, robust, undersized, jovial, and fond of amusement.

Kagoshima, a town in the S.E. of Kiusiu Island, Japan, on a gulf of the same name.

Kahtanides, one of the fundamental divisions of the Arab race—the settled as opposed to the Bedouin or nomad element—form the bulk of the population of Yemen (Arabia Felix), and claim descent from Kahtan, the Joktan, son of Heber (Genesis x. 25). From a legendary Himyar, grandson of Kahtan, they took the name of Himyarites, the Homerites of Greek writers [HIMYARITES]; but with the adoption of Islam they gradually laid aside their old Himyaritic speech, and now speak

the Koreish, or classical Arabic of the Koran. Though now much mixed with black blood through the female slaves imported from Africa, the Kahtanides are still regarded as the elder and purer branch of the race; hence are known as Arab el-Ariba, i.e. "Arabs of the Arabs."

Kai-fung, capital of the Chinese Province of Honan, about three miles S. of the Yellow River. For more than three centuries it has been the residence of numerous Jews. A disastrous flood took place here in 1887.

Kainite, a mineral of a white to flesh colour, found largely in the great deposits at Stassfurt. It consists of the sulphate of magnesium, chloride of potassium, and water. It is easily soluble in water. The crystals belong to the monoclinic system, and usually form pyramids or tablets.

Kairwan, an ancient town of Tunis, situated on an extensive plain, 80 miles S. of the capital. It was founded by the Saracen General, Okba, about 670, and became the chief seat of the Arabic dominion in Western Africa. The mosque built by Okba remains.

Kaiserslautern, a walled town in the Bavarian Palatinate on the Lautern, 52 miles S.W. of Worms. The manufactures include tissues, yarn, sewing-machines, and iron wares.

Kaithal, an ancient town in Karnál District, Punjab, 93 miles N.N.W. of Delhi.

Kajars, a Turkoman tribe of North Persia, of which since 1794 the reigning family is a member; seven original divisions long scattered over Asia Minor and Syria, but settled chiefly in Persia since the invasion of Jenghis Khan (1222). Most of the Kajars are now merged in the settled populations of Khorasan, but those of Asterabad still maintain a separate tribal organisation, being grouped in two branches, Ashaki-Bashi and Yukari-Bashi, each with six sub-groups.

Kaka, the New Zealand name for parrots of the genus *Nestor*, the single species of which (*N. meridionalis*) varies considerably. One form (*N. notabilis*) is remarkable for its change from insectivorous to flesh-eating habits. The general plumage is olive-brown, with the crown light grey and the under surface crimson. *N. productus*, the Port Phillip *Nestor*, is extinct.

Kakanda, a Negro people of Central Sudan, along the right bank of the Niger north of the Benue confluence. Being well armed with rifles, and owning many boats, the Kakandas control the trade of the Middle Niger. Before the establishment of the British Royal Niger Company, they dealt chiefly in slaves and ivory, which they bartered for firearms, salt, and manufactured goods. Their relations extended as far as the Hausa states of Yakoba and Kano, and they traded even with the merchants of Ghadames on the Tunis frontier. (Rohlf's.)

Kakapo (*Stringops habroptilus*), the Owl, or Ground Parrot, a native of New Zealand, in danger of extermination, because its flesh is esteemed a delicacy, and, though possessing large wings, it is

unable to fly. The first English popular name refers to its nocturnal, and the second to its burrowing, habits. It is about 24 inches long, and the soft plumage is green mottled with brown and yellow.

Kakar, a large division of the Afghan people, between the Ghilzaes and Baluchistan N. and S., and conterminous on the W. with the Waziri. Since 1881 Yaghistan ("Free Land"), as they call their territory, has been brought within the advanced frontier of British India towards Candahar. The Kakars are not the fierce and bellicose hillmen that they have been represented, but, on the contrary, peaceful pastoral nomads, who encamp in small groups of three or four families under their *kizhdi* (black tents), and some of whom take part in the caravan trade between Herat and India. All are Mohammedans, and speak a Pushtu (Afghan) dialect, although doubts have been thrown on their Afghan origin, some affiliating them to the Turki race, others regarding them as fundamentally Rajputs or perhaps Jats. There are two detached groups, the *Gaduns* of the Mahaban and Chach valleys north of Attock, and the *Taimani Char-Aimak* of the Ghor Mountains, both of whom claim to be pure Kakars. Of the Kakars proper there are nine main divisions: Jala, Musa, Kadi, Usman, Khidar, Abdula, Kabi, Hamza, Shabo, with whom Elphinstone includes the Sanatials; total population, about 200,000.

Kakhyens (CHINS), collective name of numerous hill tribes about the Burma-Chinese frontiers, Upper Irawady basin above Bhamo. They call themselves Singpho (Chingpaw), i.e. "Men;" but there are a great number of tribal names comprised in their four chief divisions: Maru, Adzi, Lishoni, and Tashons. These last, who are said to muster as many as 10,000 fighting men, are the most powerful of all, and gave great trouble to the English in the border warfare that broke out after the annexation of Upper Burma; but they were at last reduced, together with their Yahun neighbours, in 1892. The Kakhyens are generally grouped with the Tibeto-Burman family, but they appear to be a very mixed people, amongst whom two types predominate: (1) The true Singpho, with short round head, low forehead, prominent jaws, oblique eyes, broad nose, thick protruding lips, dark brown hair and eyes, dirty buff complexion, low stature (5 feet to 5 feet 4 inches), very short legs. (2) Regular features, long oval face, pointed chin, aquiline nose, fair colour, often almost white. The language is monosyllabic, entirely distinct from Burmese, and showing a great resemblance to the Mishmi and Abor of North Assam. (Dr. J. Anderson, *Mandelay to Momien*, 1876.)

Kalahari Desert, a vast plain in S. Africa, lying between the two great plateau systems on the E. and W., and extending from 21° to 28° S. lat. The general elevation is about 3,500 feet. Game is abundant, and in most parts it is covered with vegetation throughout the year. The Bakalahari, who, with a few Bushmen, form the inhabitants, are to some extent an agricultural people.

Kalamazoo, a thriving town on the River Kalamazoo, Michigan, U.S., 100 miles N.E. of Chicago.

Kaleidoscope is the name of an instrument invented by Sir David Brewster (1817) for "seeing beautiful pictures." It consists of two mirrors placed at an angle which is an even submultiple of 360° in a cylinder at one end of which is an eye-glass and at the other an object box formed by two glasses, between which are placed pieces of variously coloured glass. By turning the cylinder a countless number of pictures may be obtained.

Kalgan, a Chinese town on the Great Wall, in the province of Chihli, 110 miles N.W. of Peking. The *tutung* governing the Tsakhar tribe of Mongols to the N. of the wall resides here. It is one of the chief places on the trade route through Mongolia.

Kalidása, a famous Indian poet, whose great drama *Sakuntala* ("The Lost Ring") has been translated by Sir William Jones (1789) and Sir Monier Williams (1855). His date is extremely doubtful, but it seems probable that he lived in the 6th century A.D.

Kalinjar, a town and hill-fort of great antiquity in the N.W. Provinces of India, standing on a rocky and isolated hill, 1,230 feet in height, 33 miles S. of Banda. Its records date back to a prehistoric period, and it is rich in architectural remains, including the ruins of the magnificent temple of Nál Kantha Mahádeo.

Kalisz, a town of Prussian Poland, capital of a government of the same name, 132 miles W.S.W. of Warsaw. It is situated on the Prosna, near the German frontier. In the neighbourhood the Swedes were defeated by Augustus, King of Poland, in 1706.

Kalkas (KHALKAS), a main branch of the eastern Mongolians, stretching along the northern fringe of the Gobi Desert from Manchuria to Zungaria; are typical Mongols, with broad flat face, high cheek-bones, wide nostrils, small narrow eyes, large ears, coarse black and lank hair, scanty beard, dirty yellow sunburnt complexion, stout thick-set figure rather above the average height; speech differs considerably from that current amongst the southern Mongols. All are Buddhists subject to China since 1691. They comprise four *aimaks* (principalities) and 86 *koshungs* (banners), each under a hereditary khan (prince), who is responsible to the Peking Government for the taxes and the maintenance of order; population 400,000 to 500,000, all tent-dwellers, shifting their camping-grounds with the seasons.

Kallima, a genus of butterflies, popularly known as the "Dead Leaf Butterflies," owing to their striking resemblance to a dead leaf; the most notable cases occur in the East Indies. The resemblance is of value for protective purposes, as the insects are overlooked by birds. [MIMICRY.]

Kalmar, or CALMAR, a Swedish seaport, on an island in the Sound of Kalmar, between the mainland and the island of Öland. There is a fine

cathedral, and the ancient castle was the scene of many historic events. Kalmar carries on a large trade, especially in timber, and has manufactures of tobacco and matches.

Kalmia, a North American genus of evergreen shrubs belonging to the heath tribe, named by Linnaeus after his pupil Kalm, who travelled in America. The genus contains several species, and has very beautiful chalice-shaped flowers with the stamens in small pouches. Some of them are said to yield poisonous honey, and the leaves, shoots, and berries of several species are also poisonous.

Kalmucks, the western Mongols, of whom there are seven main divisions: *Tanghut*, in the valley of like name; *Olot* (*Eleat*), in Ila district; *Turgut*, in Ila, Yulduz, Karashahr and Lake Lob districts; *Koshot* (*Choshod*), in Yulduz; *Kara Kalmuck* ("Black Kalmucks"), in Chanchan, North Tibet, and Lake Lob; *Sarigh Kalmuck*, in Turfan, Urumchi, and Yulduz; *Tuvat*, in Tibet. All are Buddhists and nomads, divided into numerous subgroups under *noyuns* (chiefs), who are collectively ruled by the *ghaldan* (khan or prince). It was the Turgut Kalmucks who, to escape from the tyranny of the Zungars, migrated in 1636 to the Lower Volga. But after the destruction of the Zungars by the Chinese in 1756 the majority (350,000) returned (1771) through the Kirghiz steppes to their old homes, losing half their number on the way. The Kalmuck nation is now variously estimated at from 300,000 to 500,000 souls; 160,000 are in Russia, the rest in China (Mongolia and North Tibet). In physical appearance, language, and usages they differ little from the Kalkas and other eastern Mongols. [MONGOLS.]

Kalná, a town of Bengal, on the Bhagirathi, 47 miles N. of Calcutta. It imports large quantities of rice.

Kalocsa, a town of Hungary, near the Danube, 86 miles S. of Pesth by railway. It is the seat of an archbishop, and has a fine cathedral.

Kalong (*Pteropus edulis*), one of the largest of the Fruit-bats. [BAT.]

Kalpi, a town in the N.W. Provinces, India, situated amidst rocky ravines beside the Jumna, 50 miles S.W. of Cawnpore. During the Mogul period it played a conspicuous part in the history of India. In 1858 a body of 12,000 rebels was defeated here by Sir Hugh Rose, afterwards Lord Strathnairn.

Kaluga, a town of Central Russia, capital of a government of the same name, 188 miles S.S.W. of Moscow. A trade in corn is carried on by means of the river Oka. The town is noted for its cakes, and has also leather and other manufactures. There is a large iron trade, and horses are reared on the plains in the neighbourhood.

Kama, the chief tributary of the Volga, 1,050 miles in length, has a very irregular course. Rising in the E. of the government of Viatka, it flows N.W., N.E., E., S.E., S., and finally S.W., joining the Volga 43 miles below Kazan. It is navigable from this point to Perm, a distance of 930 miles.

Kamala, or **WARS**, a red powder formed of the glands on the capsules of *Mallotus philippinensis*, a small euphorbiaceous tree which is found from the Philippines and North Australia to Arabia. Kamala has long been used in India as an anthelmintic, and was added to the British pharmacopœia in 1864. It is also used in India, with boiling carbonate of soda, to dye silk a fine orange colour.

Kamchadales, the primitive inhabitants of Kamchatka, now confined to the central and southern districts, and even here much mixed with the Russian colonists. The *Itelmen*, i.e. "Aborigines," as they call themselves, are grouped in three main divisions, now reduced to less than 5,000, of whom 3,000 are full-blood, the rest half-castes. They are a short, thick-set people, with long face, slightly prominent cheek-bones, flat nose, small sparkling eyes, yellowish colour, long black hair. The language is quite distinct from that of the neighbouring Koriaks, and shows no affinity to any other known Siberian tongue, the relations being expressed not by suffixes, but by prefixes attached to the unmodified roots. The vocabulary is extremely poor, there being but one word for the sun and moon, while birds and fishes are named from the months when they most abound. The Kamchadales are essentially hunters and fishers, living in pile dwellings (*balangan*) in summer, and in underground houses entered through a hole in the roof in winter. They are a gentle, long-suffering people, although driven to revolt in 1731 and 1740 against the intolerable oppression of their Russian taskmasters. Formerly Shamans, most of them are now at least nominal Christians ("Orthodox Greeks"). (G. Kennan, *Tent Life in Siberia and Adventures amongst the Koraks and other Tribes in Kamchatka* (1871)).

Kamchatka, or **KAMTSCHATKA**, a peninsula of Siberia, on the E. coast of Asia, between 51° and 62° N. lat. It extends into the N. Pacific Ocean, between the Sea of Okhotsk on the W. and that of Kamchatka on the E., and is 870 miles long, with a mean breadth of 180 miles; the area is 465,690 square miles. A range of mountains runs from N. to S., containing Klochevskaja (16,988 feet) and other active volcanoes. The climate is cold, especially on the E. coast, but, owing to the abundant moisture, grasses and trees grow luxuriantly. The inhabitants are chiefly engaged in fishing, and the pursuit of the fur-bearing animals in which the peninsula abounds. Kamchatka was incorporated in the Russian Empire in the latter part of the 17th century. The capital, Petropaulovski, is on the S.E. coast.

Kamenetz-Podolsk, capital of the Russian Government of Podolia, stands on the Smotritsch, near its junction with the Dniester. The Roman Catholic cathedral dates from the 14th century, the Greek cathedral from the 16th century.

Kames, **HENRY HOME, LORD** (1696-1782), a Scotch judge and philosopher, was born in Berwickshire. In 1752 he was called to the bench under the title of Lord Kames. His chief work was his *Essays on the Principles of Morality and Natural Religion* (1751).

Kampen, a small Dutch port in the province of Overijssel, near the mouth of the Yssel, $5\frac{1}{2}$ miles N.W. of Zwolle by railway. It was a member of the Hanseatic League, and retains a fine mediæval church, dedicated to St. Nicholas.

Kāmthī, or **KAMPTI**, a large town and cantonment on the Kanhan, Central Provinces, India, 9 miles N.E. of Nagpur. There is a trade in cattle, salt, grain, and timber.

Kanaka, a term applied by Europeans indiscriminately to all the South Sea Islanders, though it should properly be restricted to the eastern Polynesians, in whose language it has the meaning of "Men." Kanaka is the Hawaiian form of the word, the other chief dialectic variants being *Tangata* (Tonga group and Maori of New Zealand), *Taata* (Tahiti), *Kenata*, *Kenana*, and *Enana* (Marquesas). In all these dialects the word is used to indicate the natives themselves in contradistinction to the *Haoō*, i.e. strangers of all kinds, whites, blacks, and half-castes. At present *Kanaka* is applied more especially to the natives pressed into the service of the planters in Queensland, New Caledonia, and Fiji. In Queensland, however, *Kanaka* labour is practically extinct.

Kananj, an ancient city in the N.W. Provinces of India, situated on the Kālī Nadi, 5 miles above its union with the Ganges, and 32 miles S. of Fatehgarh. It was once the capital of a great Aryan kingdom, and reached the zenith of its power about 500 A.D.

Kanara, **NORTH** and **SOUTH**, two districts on the S.W. coast of India. The former is in the presidency of Bombay, the latter, adjoining it, in that of Madras; their area is 3,911 and 3,902 square miles respectively. North Kanara is traversed by ridges of the Western Ghats, which form the E. boundary of South Kanara. In both there are vast tracts of forest. Mangalore is the chief town.

Kanaris, **CONSTANTINE** (1785-1877), a Greek patriot who distinguished himself by his naval services during the War of Independence (1822-24). He became Minister of Marine in 1848, led the Coalition Ministry of 1848-49, and again held office in 1854-55, 1862, 1864, and 1877.

Kandahar, the capital of the province of the same name in S.E. Afghanistan, is situated on a fertile plain 318 miles S.W. of Kabul. It is irregularly oblong in form, and is surrounded by a mud wall 27 feet high and nearly 4 miles in circuit. At the point where the two main streets intersect there is a large dome 50 yards in diameter. The houses are mostly constructed of sun-dried bricks; they have flat roofs and, in some cases, upperstoreys. The trade with the neighbouring regions is carried on chiefly by Persian merchants. Kandahar is said to have been originally founded by Alexander the Great; the present town was founded in 1747 by Ahmad Shah Abdali. It was occupied by British troops in the war of 1878-80.

Kandy, a town of Ceylon, 74 miles N.E. of Colombo. It is situated on a wide plain near a

small lake about 1,670 feet above the sea. The famous tooth of Buddha is preserved in a temple in the town.

Kane, **ELISHA KENT** (1822-57), American explorer, born in Pennsylvania, entered the United States navy as assistant-surgeon, and accompanied the first Grinnell Expedition in search of Franklin (1850-52) as surgeon and naturalist. He commanded the second Grinnell Expedition (1853), and was only rescued by a relief party after an absence of three years. He published accounts of both expeditions.

Kane, **SIR ROBERT** (1810-90), a celebrated Irish chemist, founder and director of the Museum of Industry in Ireland, and for many years President of Queen's College, Cork. He published *Elements of Chemistry* (1842) and other works.

Kanembu, the people of the ancient kingdom of Kanem, and generally of the northern shores of Lake Chad, Central Sudan. They are the southernmost branch of the Tibbus of Tibesti (Central Saharan Highlands), as indicated by the name itself, which in the Tibbu language means "Southerners," from *Kanem* = "the south," and *bu* = "people;" but in this region they have become much mixed with the indigenous Negro populations, so that the Kanembu are now a Negroid people intermediate between the Hamitic Tibbus and the Sudanese blacks. The language also is intermediate between the northern Tibbu and the Kanuri of Bornu. The Kanembu are an historical people, who gave more than one dynasty to Bornu, and whose written and oral records go back to a legendary Sef, founder of a kingdom which in pagan times "ruled over the Berbers, the Tibbus, the Kanembu, and others." The people, or at least their rulers, have been Mohammedans since the 11th century, and, according to Nachtigal (*Sahara und Sudan*, vol. ii.), they number at present about 100,000, including some Arab, Bornu, and other settlers.

Kangaroo, any individual of the marsupial family Macropodidæ (with about fifty species), almost exclusively confined to Australia and Tasmania, with some representatives in the Papuan Islands. The fore limbs are small, and used chiefly for prehension, the hind limbs are enormously developed; there is no great toe, the second and third are slender and united in a common skin, the fourth and fifth are very long, and form the principal support of the body, aided by the great stout tail. The general method of progression is a series of enormous bounds. They feed chiefly on grass, and do great damage to pasture land. The flesh is eaten, and the skin tanned into leather. In disposition they are timid and inoffensive, but when provoked or brought to bay they are formidable opponents, and will seize a man and wound him terribly, and sometimes fatally, with the terrible claws of the hind limbs. They differ greatly in size, the Giant Kangaroo (*Macropus giganteus*) being about eight feet long, including the tail, while the Kangaroo Rats (*Hypsiprymnus*) are no bigger than a hare. The Rock Kangaroos (*Petrogale*) are so called from the situation they frequent; and the Tree Kangaroos (*Dendrolagus*), from New Guinea, are arboreal.



KANGAROOS.

1 Skeleton of Great Kangaroo. 2 Teeth of Great Kangaroo. 3 Brain of Great Kangaroo. 4 Tree Kangaroo. 5 Great Kangaroos. 6 Kangaroo Rat. 7 Rock Kangaroos.

Kano, a Negro town in the state of Sokoto, 12° N. lat., 9° E. long. The inhabitants are chiefly engaged in weaving and dyeing cloth.

Kansas, a river of the U.S. formed by the union of the Solomon and Smoky Hill Forks, which rise at the E. foot of the Rocky Mountains. From this point it flows 120 miles E. to the Missouri a little above Kansas City. The total length is 500 miles.

Kansas, one of the United States of America, lies between 37° and 40° N. lat. and 94° 38' and 102° W. long. It is bounded by Nebraska on the N., Colorado on the W., Missouri on the E., and Indian Territory on the S. The length from E. to W. is about 400 miles, the breadth 210 miles, and the area 82,080 square miles. The surface is a rolling prairie, rising by imperceptible degrees from about 800 feet on the E. border to 3,000 feet or 4,000 feet in the N.W. The Missouri, which skirts the state on the N.E., is the only navigable river. The S. portion of the state is drained by the Arkansas and its affluents, the N. portion by the Kansas, and its head streams, the Republican Fork and the Smoky Hill Fork. Although extremes of heat and cold sometimes occur, the climate is on the whole equable, the temperature averaging 53° Fahr. annually, and the weather is generally clear and bright. The E. part of the state is one vast coalfield; there are extensive beds of rock-salt, and lead and zinc are found in large quantities in the S.E.; Kansas is also noted for its good building-stones, including the "Leavenworth marble," "Permian limestone," and several other varieties. The chief industries are agriculture and stock-raising. Nearly one-fifth of the surface is under wheat, maize, and oats. The other industries include the cultivation of sorghum cane and manufacture of sorghum sugar, beef- and pork-packing, and the manufacture of agricultural implements, and there are many flour-mills and foundries. The state contains 106 counties, and is represented by two senators and seven members of Congress. The local legislative and administrative bodies are elected at intervals of two years. For several years after 1854, when Kansas became a territory, a fierce struggle was carried on between the anti-slavery and pro-slavery parties, resulting finally in the victory of the former. It was admitted into the Federal Union in 1861. The capital is Topeka (q.v.).

Kansas City, the name of two contiguous towns on the south bank of the Missouri, 280 miles W. of St. Louis by railway. The larger town is in the state of Missouri; the smaller, which adjoins it on the W. so as to form a suburb, is in that of Kansas. The better streets and the more handsome public buildings and private residences are in the larger town, which covers several steep hills. Several large railways converge at Kansas City, so as to make it a centre for the distribution of agricultural produce, and there are large stock-yards and pork-packing establishments, especially in the Kansas town. Car-wheels, shot, soap, etc., are manufactured.

Kant, IMMANUEL, philosopher, was born at Königsberg, in Prussia, in 1724, and died there in 1804. His father and mother were poor, God-fearing people whose religion was of the Pietistic kind. He was educated in Königsberg at the Collegium Fredericianum, where he came under the influence of F. A. Schultz, and at the university, which he quitted in 1746. The next nine years he passed as domestic tutor in various families in the neighbourhood. Returning to Königsberg as *privat-docent* in 1755, he gave lessons in metaphysics, physics, mathematics, and other subjects, and in 1770 was appointed ordinary professor of logic and metaphysics in the university. His works published before this date were *Thoughts on the True Estimate of Living Forces* (1747), *Theory of the Heavens* (1755), and *Dreams of a Visionary Explained by Dreams of Metaphysics* (1766). His *Form and Principles of the Sensible and the Intelligible World* (1770) is important as containing the complete enunciation of his theories of Time and Space, but it took him much longer to develop his views of the intelligible world, and his monumental work, the *Criticism of Pure Reason*, did not appear until 1781. It was followed by the *Foundation of the Metaphysic of Morals* (1785), the *Criticism of Practical Reason* (1788), the *Criticism of Judgment* (1790), and *Religion within the Boundaries of Mere Reason* (1793). The upshot of Kant's philosophical labours was that by reconciling the opposed views of Idealism and Realism—the one of which denied the existence of matter, the other that of spirit—he made it again possible to construct a system in which each should find its appropriate sphere. He called his philosophy a *criticism* because, instead of proceeding on a dogmatic basis, it endeavoured to determine the character of knowledge, the processes by which man becomes possessed of knowledge, and the limits within which knowledge is possible; and a *transcendental criticism*, because it began by laying down the subjective *a priori* conditions necessarily involved in all experience. Knowledge is based on synthetic *a priori* judgments—synthetic because, unless the predicate gives something not contained in the idea of the subject, nothing is added to what already existed in the mind; and *a priori* because, to be truly valid, they must be necessary and universal, whereas the widest inductions hold good only within the range of experience. The world of sense, as known to us, is composed of elements of two kinds—*material* and *formal*. The former are empirical—*i.e.* they are given in experience, and in regard to them the mind is passive; the latter are pure—*i.e.* they are given by the mind, which, in regard to them, is active. The material element in knowledge consists of sensation or impressions. The formal element is partly furnished by sensibility, partly by understanding: it embraces both the pure *a priori* perceptions of space and time as media in which all empirical perceptions must be embodied, and the pure *a priori* conceptions of quantity, quality, relation, and modality. Under each of these heads three kinds of judgment may be formed, viz.:—Universal, particular, and singular (quantity); affirmative, negative, and limitation

(quality); categorical, hypothetical, and disjunctive (relation); and problematic, assertoric, and apodeictic (modality). These twelve kinds of judgment are based on the twelve "Categories," or primitive intelligible notions, viz.:—Totality, plurality, unity; reality, negation, limitation; substance and accident, cause and effect, community or reciprocity; possibility and impossibility, existence and non-existence, necessity and contingency. An object is brought under a Category by means of the "schematism of the pure understanding," which bridges over the interval between mere sensation and pure thought by introducing the element of time, which partakes of the nature of both. In each case a certain *a priori* rule must be followed. The world of sense, as known through experience, is thus in a large measure the creation of our own minds, and consequently, on the sensuous side, we have no knowledge of the "thing in itself." In passing from the sensible to the supersensible world—from *phenomena* to *noumena*—we leave the domain of Understanding for that of Reason. The judgments of the understanding are valid, because its notions, empty in themselves, are filled with the material given in experience; but, inasmuch as experience is now no longer possible, the *ideas* of reason are void of content—they are *regulative*, not *constitutive*, elements of thought—and afford no basis for the formation of judgments. Hence reason, in formulating principles regarding the supersensible substrate—e.g. the *soul* is immortal, the *world* had a beginning in time or the *world* had no beginning in time, *God* exists—steps beyond the limits within which knowledge is possible (in Kantian phraseology, becomes *transcendent*), and the result is mere "paralogisms," "antinomies," and, in the case of the Deity, an empty ideal. We are thus forced to turn to the *regulative* function of the ideas, and this brings us within the domain of practical reason. My conscience presents me with a moral law—a "Categorical Imperative," which I am bound to follow, subordinating to it all the merely animal volitions which spring from desire based on pleasure and pain. The Categorical Imperative, placed as it is beyond the sphere of sense, cannot be directly embodied in a concrete proposition, but in regard to its universal validity it may be formulated thus: Act as if the principle by which you act were by your will to be made a universal law of nature. It must constrain our wills entirely by its own force; we must obey it simply because we respect it, not because we look forward to the pleasure which accompanies right action. The will, therefore, which acts in conformity with the moral law must be autonomous, and this involves the idea of the subject as a free cause. But within the limits of sensuous existence we cannot arrive at the state of perfection demanded by the moral law, and thus the immortality of the soul reappears as a postulate of the Practical Reason. Again, in the world of sense the aim of actions performed in obedience to the moral law must be the happiness of our fellow-men, but we cannot be sure that universal happiness will result from right action unless we believe that the course of the world is directed by a Supreme Intelligence. The ideas, which were proved value-

less from the theoretical standpoint, are thus shown to be part of the equipment which man must possess as a moral agent. We are now confronted with the question, How can there be any connection between the sensible realm of nature and the supersensible realm of freedom? It lies in the very idea of freedom to realise in the world of sense the end presented in its laws, and therefore there must be a principle which unites the supersensible substrate of nature with the supersensible which is involved practically in the conception of freedom. The link is found in the faculty of judgment, which furnishes the *a priori* conception of design as the final cause of sensible existence, and thus bridges the chasm between the phenomenal and the intellectual world.

Kanuri, the dominant people of the kingdom of Bornu, Central Sudan, originally Tibbus (Hamites), but now of distinctly Negroid type, with square coarse features, nearly black complexion, woolly or frizzly hair, angular ungainly figures, altogether contrasting unfavourably both in appearance and moral qualities with their western neighbours, the Hausas. Traditionally they came from the north, and their language (*Manna Kanuri*) is closely connected through that of Kanem with the Daza and Teda (southern and northern Tibbu). There are three distinct varieties: Kanuri proper, current in the province of Gazir; Munio and Nguru, spoken collectively by over half the inhabitants of Bornu, or by about 3,000,000 altogether. All the Kanuri people proper have been Mohammedans for many generations, although pagan practices still largely prevail throughout the southern provinces of Bornu. (Nachtigal, *Sahara und Sudan*, vols. i. and ii.; Barth, *Central Afrikanische Vocabularien*; Kocle, *Kanuri Grammar*.)

Kaolin, the Chinese name of *china-clay*, known in Cornwall as *growan clay*. It is a pure clay (q.v.) or hydrous silicate of alumina, containing, on an average, 46 per cent. of silica, 40 per cent. of alumina, and 14 per cent. of water, and results from the decomposition of white potash-, or soda-, felspar in a granite known in its partly decomposed state as *carclayzite*, from Carclaze, in Cornwall. It was first found in England in the Hensbarrow district by William Cookworthy about 1750, though the "soft growans" containing it had long before been worked for the veins of tinstone that traverse them. The pure clay is freed from the quartz and mica by streams of water and is then dried. It is packed in tierces of half a ton weight, many thousands of which are now produced annually. Being practically infusible, it forms in porcelain manufacture the "bone" of the ware, the more fusible china-stone or *petuntzite* (q.v.) forming the "flesh." The clay is also much used for "loading," or adding weight to, paper, calico, etc. Possibly the *kaolinisation* or decomposition of felspar is partly owing to the presence of fluorine in tourmaline, fluor, or some other mineral, in the rock, and not merely to the action of atmospheric carbon-dioxide and moisture.

Kara (from Tatár, also Turkish, meaning "black"), the name of a number of places in Asia—

among them, of the famous Russian convict settlement, beside a small river, and extending 20 miles along a desolate valley, of the same name, some 300 miles from Chita, the capital of Trans-Baikalia. The mines yield 400 lbs. of gold yearly to the Tsar's private purse. State offenders were sent here largely after the revolutionary activities of 1879. Two of the seven prisons are for "politicals"—men and women. Mr. Kennan (*see his Siberia and the Exile System*) in 1885-86 found some of the prisons in a horrible state of filth. Scurvy, typhus, etc., had a permanent hold; and here, far from the eye of the outer world, the most varied and elaborate brutalities were freely practised, noble and cultured men and women being driven to face the dread alternatives of disease, insanity, and suicide. Particularly tragic is the story of Madame Kavalefskaya, sister of a well-known political economist and wife of a professor of Kiev, and of Madame Hope Sigida, a lady twenty-five years old, wife of a civil officer. Madame Kavalefskaya, separated from her husband and little child and exiled in 1879, became insane, was removed twice and brought a third time to the mines, took part with other women in the sixteen days' hunger-strike after the violent treatment of Madame Kavalskaya, and in November, 1889, after the flogging to death of Madame Sigida, committed suicide, as did two other women and two men, by taking poison. About twenty others who took poison recovered. The few privileges of the "politicals" at Kara have since been revoked, and they are treated as common criminals.

Karagass, a Turki people of South Siberia, where they occupy the northern slopes of the Sayansk range between the Angara river and the headwaters of the Yenisei. Physically the Karagass resemble the neighbouring Kirghiz nomads, although regarded by Castren as originally Samoyedes. Most of them are nominal Christians, but still practise many old Shamanistic rites; some are settled in villages, where they cultivate a little land, but the majority are still hunters and trappers, employed by the Russian traders in procuring the costly furs of animals frequenting the surrounding forests.

Karaites, the Jews of the Crimea. They form a distinct sect, which is distinguished by its close adherence to the text of the Pentateuch and its rejection of the Talmud. By some authorities the Karaites are considered to be descendants of the Tatar *Khazars*, who were converted to the Jewish religion in the 7th century, and this view is confirmed by the fact that certain Hebrew inscriptions discovered in the Crimea, and dating from the 8th century, bear distinctly Nogai-Tatar names. The Karaites were founded in the year 780 by one Anan, and the sect were first called Ananites. The Russian Karaites, as distinct from the Rabbinic Karaites, are the more numerous. *Karaites* is derived from the Hebrew word *Kara*, "to read," because, so to say, they "read" nothing but the Old Testament and reject the authority of the rabbins. Formerly the Karaites were widely diffused, but are now confined mainly to the Crimea, and to a few scattered groups in Lithuania, Galicia, Syria, Jerusalem,

Constantinople, and Alexandria, numbering altogether about 6,000.

Kara-Kalpaks, *i.e.* "Black Caps," a Turki people of Khiva and Bokhara, in speech and customs similar to the Kirghiz and in features intermediate between the Kirghiz Kazzaks and the Uzbeks; large head, flat full face, large eyes, flat nose, pointed chin, stout thick beard, the largest and strongest race in Central Asia. Formerly nomads, are now partly settled, and engaged chiefly in cattle-breeding. Chief tribes: Baymakle, Khandekli, Achamayli, Kaychili, Kitai, Ingakli, Kenedoz, Shaku, Tomboyun, Ontonturuk, about half a million altogether. The Kara-Kalpaks settled in the 12th century in the Kief district, South Russia; are now absorbed in the surrounding Little Russian populations.

Karakoram, or TSUNG LING MOUNTAINS, a division of the Himalayas extending from the Hindoo Koosh in the west along the boundary of Cashmere into Tibet on the east. The range in general varies in height from 18,000 feet to 25,000 feet, but the peak known as K2 is over 28,000 feet high. The Karakoram Pass, almost in the centre of the chain, and the head of the Shayok Valley, is about 18,500 feet high. It was found by Dr. Thomson, who ascended it in 1848, to be quite free from snow. The old capital of Mongolia, ruins of which remain, also has this name.

Karamnasa ("Destroyer of pious souls"), a river of Hindustan, which is a tributary of the Ganges, and forms the boundary between Behar and Allahabad. Its name is derived from the belief of the Hindoos that contact with its waters nullifies the effects of former pious acts.

Karamzin, NICHOLAS MICHAILOVITCH (1765-1826), a Russian historian, novelist, and poet, after serving for some time in the Imperial Guards, went on tour in Western Europe, visiting England among other countries. His *Letters from a Russian Traveller*, published in 1789, were translated into both French and English. The great work of his life was his *History of the Empire of Russia*, consisting of 12 vols., which appeared between 1816 and 1828.

Kara Sea (*Kara*—"Black"), that part of the Arctic Ocean which lies between Novaia Zemlia and the boundary between Russia and Siberia. The name is also given to a bay on the same coast, and to a river which enters it, after a course of 150 miles, beginning in the Ural Mountains. The Kara Sea has been explored by Nordenskjöld and Wiggins. It is navigable from July to September.

Karateghins, an Iranian people of Eastern Turkestan akin to the Tajiks and Galchas of Kohistan; speech a Persian dialect with some local peculiarities, but differing little from the dialect current in the Zerafshan Valley. The Karateghins, who number about 100,000 altogether, are, in the strict sense of the expression, the "hewers of wood and drawers of water" throughout Russian Turkestan.

Karategin, a mountainous district of Upper Bokhara, watered by a stream of that same name, a tributary of the Oxus, is at the western base of the Pamirs about 120 miles south of Khokand. Fruit and corn are grown by the Tajiks, whose Khans were independent until 1868.

Karauli, a native state in Rajputana, Hindustan, with a capital of the same name surrounded by a wall of sandstone. The district is rich in timber.

Karens (KABAEN, KARYAN), a widespread primitive people of Indo-China, scattered in countless small groups throughout Tenasserim, Arakan, Pegu, and on the Burma-Siamese frontiers. There are three main divisions—the White, Black, and Red Karens, so designated from the colour of their dress. Most of the tribal names—such as Sgau, B'ghai, Puo, Taru, Mopgha, Kai, etc.—have simply the meaning of "Men" in their several dialects, all of which are closely related, forming an important branch of the Tibeto-Burman linguistic family. But there is considerable physical diversity, though, as a rule, the Karens are a stout, muscular people, of short stature (5 feet 4 inches), yellowish complexion, but in the north often nearly as fair as that of Europeans, jet black straight hair, flat Mongolic features. The Karens, who number collectively over a million, are mostly nominal Buddhists, but at heart fetishists and spirit-worshippers. Some have given a favourable reception to the Protestant missionaries, and as many as 147,000 were returned as Christians in the census of 1901 for British Burma. The Karen-ni (Red Karens), who form a somewhat compact group of semi-independent tribes towards the Siamese frontier, are the best known, and are usually taken as the type of the whole race. (Rev. F. Mason, *Religion, Mythology, and Astronomy among the Karens*, *Journal of the Asiatic Society*, 1865, and many other writings.)

Karikal, a French possession on the Coromandel coast of Hindustan, some 20 miles north of Negapatam. It has an area of more than 50 square miles. The soil is fertile, and much rice is raised from it and is exported to Ceylon and the Straits Settlements.

Karli, the largest temple-cave of India, and the oldest known to exist, is on the road between Bombay and Poona. It consists of a porch, and an interior composed of a nave and two aisles terminating in an apse. Over the entrance is a large window, and the nave has fifteen finely-ornamented pillars. The temple is 126 feet long, 45 feet broad, and 45 in height, and dates from 78 B.C.

Karnul, or KURNOOL, a district and town in the presidency of Madras with an area of 7,788 square miles. The town is situated on the right bank of the Kistna, which is the boundary between the presidency and the Nizam's dominions. Fever is frequent, and in 1877-78 there was a grievous famine.

Karoks, a North American people, who formerly occupied the Klamath river valley, about the borders of California and Oregon, jointly with

the Yuroks and Modoks. These names indicate the several positions of the three tribes, *Ka-rok* meaning the "lower river," *Yu-rok* the "upper river," and *Mo-dok*, the "head of the river." The Karoks are described as physically the finest of all the Californian natives—tall, shapely figures, well-proportioned extremities, features more regular than those of most Indians. Their arms were the bow and arrow and a chipped stone, with which fearful wounds could be inflicted in hand-to-hand fights. They worshipped the spirits of the earth and forests, and paid great respect to the dead, who were buried with much ceremony. (R. S. Powers, *Tribes of California*, in *Contributions to American Ethnology*, Washington, 1877.)

Karons, a savage people of north-west New Guinea, who occupy the uplands back of Geelvinck Bay; visited in 1879 by M. Raffray, who regards them, not as Papuans, like most of the New Guinea populations, but true Negritos, resembling the Aeta aborigines of the Philippine Islands. They are an extremely rude people, living exclusively by the chase, dwelling in wretched hovels made of branches, wearing no clothes except a few strips of bark dangling from a string round the loins, and addicted to cannibalism, which, however, is restricted to the enemy killed in battle. Short, thick-set figures, curly hair, very prominent superciliary arches, deep brown complexion, wild unsteady glance. (*Tour du Monde*, xxxvii.)

Karotis, a chief branch of the Povindah Afghans, who occupy the Dwa Gomal Valley and the hills east of Paltu; three main divisions: Zaku Khel, Ya Khel, and Adin Khel; appear to be originally Ghilzaes, who joined the Povindahs in comparatively recent times.

Karr, JEAN BAPTISTE ALPHONSE, commonly known as Alphonse Karr, was born in 1808 at Paris. The future writer was educated at the Collège Bourbon, and became a journalist. As a journalist he became editor of the *Figaro*, and in 1839 began to conduct a satirical monthly called *Les Guêpes*. Of his novels *Sous les Tilleuls*, published in 1832, was the first and best. He was a great gardener, and his *Autour de mon Jardin* was translated by J. G. Wood. His memoirs, written at Nice, whither he had retired in 1848, appeared in 1879, under the title *Le Livre de Bord*. He died in 1890.

Karroo, a name given to the high plains of South Africa, but usually applied to the Great Karroo, a plain situated between the Nieuweveld Berge on the north, and the Zwarte Berge on the south. Rain does not fall for nine months in the year, but after the wet season large flocks are fed on the grass which springs up.

Kars, the capital of a district ceded to Russia by the Treaty of Berlin (1878), is situated on a tributary of the Arar about 110 miles N.E. of Erzerum. It stands in a very strong position 6,000 feet above the sea-level, and, as an important fortress, was for a long time a bone of contention between Russia and Turkey. In 1828 it was captured from the Turks by Paskevitch; in 1855 it stood a siege of six months under General Williams,

an account of which has been written by Laurence Oliphant; finally, it was taken by storm by General Lazareff in November, 1877, after having been for some months the centre of operations.

Karshi, a town in the Khanate of Bokhara, Central Asia, about 80 miles S.S.W. of Samarcand. Its ancient name was Naksheb. Commercially it was one of the most important cities of Central Asia, knives and firearms being sent from it to all the surrounding countries.

Karún River (Persian KUBAN), a Persian river of some importance, rises near Ispahan and, flowing first west, takes a southerly direction just above Shuster, and empties itself into the Persian Gulf a few miles to the east of the mouth of the Tigris. It has a total course of about 300 miles, but is navigable only for about two-thirds of its length, and at Ahwaz rapids impede navigation even within the navigable distance. The importance of the river as a channel for trade was pointed out so early as 1842, but it was only in 1888 that, in consequence of the representations of Sir H. D. Wolff, the Karún was thrown open to the vessels of all countries by royal proclamation.

Karyokinesis, the series of changes in the nucleus of a living cell which take place when it divides.

Kas, an ancient people of the Upper Indus, who, according to Sultan Baber, gave their name to Kashmir. W. Erskine thinks the *Kasia regio* and the *Kassi Montes* of Ptolemy beyond Mount Ionaus were inhabited by the same people, whose dominion at some period extended from Kashgar to Kashmir, in both of which countries they have left their names.

Kaschau, KOSITZE, or KASSA, a town in the north of Hungary, about 100 miles N.E. of Pesth. This ancient city, which is situated very picturesquely in the valley of the Hernad, is no less famous for its hams than for its Gothic Cathedral. It had once also a Jesuit university. In its square the river divides and forms an island, on which is a statue of St. John Nepomuk. Kaschau has a royal tobacco factory and an agricultural institute, and is the residence of a Roman Catholic Bishop.

Kashan, a town of Persia rather less than 100 miles N. of Ispahan. It stands more than 3,000 feet above the level of the sea in a district abounding in fruits. Kashan itself has an active trade in shawls, silk stuffs, and agricultural produce, and is particularly noted for its glazed tiles called *kashi*. It contains a royal palace, and many mosques and baths.

Kashgar, the capital of Chinese Turkestan, stands on a river of the same name, which waters a district noted for its many excellent fruits. It has been in the possession of China since 1758, though there was in 1864 a rebellion of the Turks, who form the greater part of the inhabitants, by which it was withdrawn from their power till 1879. The new city (Yenghi Sheher) is divided from the old by the river. It is the residence of the Chinese Governor and of the Russian Consul, who, being the sole representative of European Powers, has

obtained for his country not only the whole of the foreign trade, but an important political predominance. The manufacture of cotton and silk goods, porcelain, and other articles flourishes; and Kashgar is also a sacred city of the Mohammedans, who come hither to visit the shrine of Hazreti Appak Khodja.

Kashgari, a mixed Tatar people akin to the Uzbeks, forming the bulk of the population in Kashgar, with settlements in Ferghana, Andijan, and neighbouring districts, East Turkestan. Tall stature, olivaster complexion, black, red, or chestnut hair, full beard, brown eyes. Speech a marked Turki dialect current throughout Eastern Turkestan, but spoken in its purest form in the province of Aksu; has long been cultivated, and was formerly written in the Tatar character of Syrian origin, which is now replaced by the Arabo-Persian. (Ch. de Ujfalvy, *Revue d'Anthropologie*, 1879, p. 489.)

Kashmiri, the dominant people of Kashmir, North-West India, who are of nearly pure Aryan stock; tall, strong, well-built, with regular European features, light olive and even fair or ruddy complexion. The language (Kashur) is a Prakrit, or Neo-Sanskritic tongue, spoken with considerable diversity in the different provinces, and overcharged with Persian elements. It is a harsh, rude language, which appears never to have been cultivated, although there was an old Kashmiri alphabet, the so-called Sharada Achhar, which was introduced into Tibet in the 7th century. This script appears to have been used exclusively for Sanskrit works, and is, in fact, incapable of rendering the peculiar Kashmiri phonetics. Modern Kashur is written with the Persian alphabet, at least by the Mohammedans, who form the bulk of the population; inhabitants of Kashur speech about 1,650,000.

Kaskaskia, a river of Illinois, U.S.A., rises in the centre of the state, and flows for more than 200 miles in a south-westerly direction till it joins the Mississippi about 50 miles S. of St. Louis. Two places in Illinois also bear this name, one of which, near the junction of the river with the Mississippi, was the capital of the former territory of Illinois.

Kassassin, a canal-station between Ismaïlia and Zagazig, Lower Egypt, which was the scene of an action between the British troops and those of Arabi Pasha in 1882.

Kassubs, small groups of Wends (Slavs) still surviving amid the Teutonic populations of North-East Germany, most numerous in the Stolp district, Pomerania, and in the Karthaus and Neustadt circles, East Prussia. They give their name to the tract known as *Kassubenland*, comprising the part of West Prussia west of the Vistula, where none now survive.

Kastamuni, or CASTAMBUL, a town of Asia Minor, about 75 miles S.W. of Sinope, the name being also given to the whole coast from the mouth of the Sakaria to Sinope. It is now a fairly flourishing manufacturing town, and was once celebrated for its copper-wares. Its name is supposed to be derived from the fact that the castle of the Comneni was here.

Katabolism, or destructive metabolism, is a term employed in physiology, especially in that of plants, for all the processes of decomposition by which the relatively complex organic substances in the living organism are spontaneously broken down into relatively simpler substances. These processes are largely produced by zymoses or unorganised ferments (q.v.), such as diastase (q.v.), invertin, emulsin, and peptogenes; but simple oxidation also occurs. Respiration (q.v.) is to a great extent a conditioning cause, and in part a result, of katabolism. The products of the process are those *waste-products*, such as carbon-dioxide and water, which are exhaled, the organic acids, aromatic substances, colouring-matters, glucosides, alkaloids and waxes, which may be excreted by glandular action or may only be secreted; and also some of the plastic materials. Growth and movement involve a dissipation of energy, requiring a supply of oxygen and resulting in the giving-off of heat and even in some cases of light. [PHOSPHORESCENCE.] The heat evolved is generally not sufficient to produce a sensible rise of temperature, but it does so in germinating seeds, as in malting, and in some cases of flowering, such as that of the aroids. [PHYSIOLOGY.]

Kataghan, an important branch of the Uzbek Tatars, who form the mass of the population in Kunduz and Balkh (Afghan Turkestan), from the northern slopes of the Hindu-Kush to the left bank of the Upper Oxus, with a few groups on the right bank in Bokhara; small stature, broad flat features, small oblique eyes, beardless face. Formerly nomads, now mostly sedentary traders and agriculturists; all Sunnites (orthodox Mohammedans); two main divisions, *Besh-bula* with five sub-groups, and *Cheguna* with sixteen sub-groups; total population 220,000 in Afghanistan, 45,000 in Bokhara. (C. M. Macgregor, *Afghanistan*, 1871.)

Kater, HENRY (1777-1835), an English man of science of German descent, was born at Bristol. He passed two years in a lawyer's office, and in 1794 entered the army. He served some years in India, where he was employed in triangulation and in the measurement of an arc of the meridian. He was placed on half-pay in 1814, and was next year elected F.R.S. He suggested an improved hygrometer; devised an improved pendulum; and in 1821-23 was one of Arago's assistants in making observations for determining the difference of longitude between the meridians of Greenwich and Paris. In 1817 he received the Copley Medal for the invention of a new pendulum; he also invented the floating collimator.

Kater's Pendulum was invented by Henry Kater, and used by him about 1817 to determine the length of the seconds pendulum. It consists of a long metallic bar provided with knife-edges at two points—one near each end. Between the knife-edges are two movable weights, which can be so arranged that whichever way up the pendulum is suspended, the time of oscillation is the same. The distance between the two edges, which are thus made to become in turn centres of suspension, can

be proved to be equal to the length of the equivalent simple pendulum. From this the length of the seconds pendulum can be calculated, for the time of oscillation of a single pendulum is proportional to the square root of its length. [PENDULUM.]

Kathiawar, a bowl-shaped peninsula on the N.W. coast of India, having the Gulf of Cutch on the N. and that of Cambay in the south. Rajkot, the capital, is the seat of the Kathiawar Agency, a collection of 187 states formed in 1822. Of these, 105 are tributaries of the Imperial Government; of the rest some are independent, and some tributaries of native princes. Much cotton is manufactured for export.

Kathri, a large and influential trading caste, Punjab, North-West India; two main divisions: Sarin with eight branches, and Bhanjai with three branches. There are altogether no less than 150 minor groups, with total population 400,000. (Sherring, vol. ii., p. 76.)

Katkoff, MIKHAIL NIKIFOROVITCH (1818-87), a Panslavist leader, was a native of Moscow, but studied also at Königsberg and Berlin. After becoming Professor of Philosophy in the university of his native place, he in 1861 began to edit the *Moscow Gazette*, which, under his direction, soon abandoned Liberal politics for reactionism, combined with the extension of Russian influence over Poland and the other non-Russian dominions of the Tsar. The influential publicist died at Snamensky after having attained considerable popularity.

Katodis, aborigines of North Konkan, northern extremity of the Western Ghats, west coast of India; probably a branch of the Varalis, and like them are low-castes, regarded as impure by the Hindus, who nevertheless fear them for their reputed magic power. The Katodis are one of the most degraded people in India, feeding on rats, reptiles, and even carrion, and worshipping the *Acacia catechu*, the tree from which they extract the *kât* (*terra japonica*), which is their chief occupation.

Katrine, LOCH, a lake in Western Perth, touching the N. of Stirling on its W. border. It stands considerably more than 300 feet above the level of the sea, and has an area of 3,119 acres. Its average breadth is about three-fourths of a mile, and it is in some places more than 350 feet deep. Between it and Loch Vennachar on the E. are the Trossachs, and at its S.E. corner rises Ben Venue, 2,393 feet in height. The lake is associated with Scott and Wordsworth, the former making it the scene of his *Lady of the Lake*. From Loch Katrine the city of Glasgow draws its water supply.

Kauffmann, ANGELICA (1741-1807), a fashionable portrait painter, was born at Chur, canton Grisons, her father being an artist. She devoted herself to historical subjects during a residence at Rome, and having studied in the Venetian School at the fountain-head, came to London in 1766. Here she lived with her father in Golden Square, and painted portraits of Queen Charlotte, Christian III. of Denmark, Garrick, and the Princess of Brunswick with

her child. The last is in the Hampton Court collection. She exhibited at the Academy between 1761 and 1797, and painted the ceiling of Burlington House Council Chamber. In 1781, soon after her marriage with Zucchi, a Venetian painter, she left England. In 1787 she met Goethe at Rome, and painted his portrait. Among her numerous admirers were Joseph II., Sir Joshua Reynolds, by whom she was twice painted, Goldsmith, and Klopstock. She continued to paint till the last, and died at Rome in 1807. In 1767 she was secretly married to a Count de Horn, who turned out to be an impostor.

Kaufmann, CONSTANTINE VON (1818-82), Russian general and administrator, was born at Maidani, in Poland. He first distinguished himself in the Caucasus during the Crimean War, at the beginning of which he was a lieutenant and at the end a major-general. Having been successively director of engineers and Governor of Lithuania, he entered upon the field of his greatest exploits, when in 1867 he became Governor of Turkestan. In the following year he occupied Samarkand; in 1873 he made an expedition to Khiva, and forced the Khan to become a vassal of the Tsar; he next, unmindful of British protests, subdued the Tekke Turkomans and the Khan of Khokand; and finally succeeded in embroiling England with Afghanistan by inducing the latter to receive a Russian mission. Although he had extended Russian influence from the Sea of Aral to the borders of Afghanistan, his designs upon Merv were considered premature by the advisers of the Tsar, and he was on a visit to Moscow to put forward his views at headquarters when he died.

Kaulbach, WILHELM VON (1805-74), a German painter of the Düsseldorf and Munich School, was born at Arolsen, in Waldeck. He became the pupil of Cornelius at the Düsseldorf Academy, and in 1826 accompanied him to Munich, where in 1849 he became Director of the Academy of Painting. Here he executed for the King of Bavaria his *Battle of the Huns* and numerous mural decorations, and illustrated *Faust*, *Reinecke Fuchs*, and other German classics. In 1847 he began to be engaged upon the decoration of the staircase of the Berlin New Museum, and in twenty years produced six enormous frescoes and numerous smaller designs.

Kaunitz, WENZELIUS ANTON, PRINCE VON (1711-94), a great Austrian diplomatist, was born at Vienna. Like Talleyrand, he was destined for the priesthood, and actually received orders; but, as his elder brother died, he was able very soon to enter upon the career of a diplomatist. He was named Aulic Councillor in 1735, and, having gained some distinction in missions to several of the Italian courts, was entrusted in 1744 with the then important post of minister to the Austrian Netherlands, where he for some time acted as Governor. In 1748 he signed the peace of Aix-la-Chapelle on behalf of Austria, and two years later was sent as minister to Versailles. Here, with the help of Madame de Pompadour, he accomplished a revolution in European politics by putting an end to the

hereditary rivalry of the Hapsburgs and Bourbons. Thus in the Seven Years' War Austria had the assistance of her old foe in the struggle with her young rival, Prussia, against which power Kaunitz and Maria Theresa directed all their efforts. From this time Kaunitz, now Chancellor, guided all the counsels of the Empress. Like her, he was opposed to the partition of Poland. Although he approved of the reforms of Joseph II., he had not equal influence with that monarch; but during the short reign of Leopold II. (1790-92) he resumed his pre-eminence. On the accession of Francis II. he was compelled by old age to retire.

Kauri Pine, *Dammara australis*, a coniferous tree from 150 feet to 200 feet in height, native to New Zealand. It yields a hard, brittle resin resembling copal, and known as *Kauri* or *Cordie* gum. This resin is also found in a fossil state. The annual export of the resin is valued at about £300,000, nearly half the amount exported going to the United States, and the other half—from 3,000 to 3,500 tons—to England. It is used in the manufacture of varnishes. The wood of the tree is much valued in New Zealand and Australia for lightness, elasticity, strength, and durability, it being well suited both for masts and for planking.

Kava, a beverage derived from the shrub of the same name; it is intoxicating, and was much used by the Polynesian natives.

Kavanagh, JULIA (1824-77), novelist and biographical writer, was born at Thurles. After passing most of her youth in Paris she came to London in 1844, and three years later published a tale for children. She was also the author of *Woman in France during the 18th Century*, *English Women of Letters*, and of *Daisy Burns*, *Rachel Gray*, and many other novels. She died at Nice.

Kaveri, THE, or CAUVERY, a river in Hindustan, has its source in the Western Ghats, a little to the S. of Mereara, Mysore. It flows for a few miles in a northerly direction, and then takes an easterly course, until about 90 miles beyond Seringapatam, where it takes a southerly turn, finally joining the Coleroon some fifty miles E. of the Neilgherry Hills. The united stream having a length of nearly 500 miles, forms a large delta, the several mouths flowing into the Bay of Bengal. The Kaveri is of little use for navigation, as its stream is interrupted by frequent rapids, but it is an important fertilising agent, having been used for irrigation purpose from time immemorial.

Kaviaks, a people of Alaska, who dwell on the shores of Norton Bay and in the peninsula west of the Yukon river, to which they give their name. They are much taller and stronger than their Eskimo neighbours, whom they resemble in many respects. The Kaviaks, who number about 1,000, shave the head, and have the curious custom of wearing two long bones like tusks attached to both sides of the mouth.

Kaye, SIR JOHN WILLIAM (1814-76), the military historian, second son of Charles Kaye, of Acton, was educated at Eton and Addiscombe, and

served for nine years in the Bengal army. He returned to England in 1845, and in 1856 succeeded John Stuart Mill as secretary of the political and secret department of the India Office, from which position he retired in 1874. He was a frequent contributor to periodicals, and the author of numerous works, the chief of which were *The History of the Sepoy War in India, 1857-58* (3 vols.)—which was continued by Colonel Malleson, and appeared in complete form in 1890 in 6 vols. entitled Kaye and Malleson's *History of the Indian Mutiny—Life and Correspondence of Lord Metcalf, Life and Correspondence of Sir John Malcolm, and History of the War in Afghanistan*.

Kazan, a government of Russia, having Nijni-Novgorod on the W., Viatka on the N., and Simbirsk on the S. It has an area of more than 24,000 square miles, and an increasing population. Forest covers about a third of the soil, but from the rest rye and wheat are raised. 2. Kazan, the capital, stands on the left bank of the Volga, 430 miles directly E. of Moscow. Some 30 miles N.W. of its site stood the old capital of a Mongol kingdom which was conquered by the Russians in 1552. Of this date are its cathedral and monastery. Kazan is important both commercially and as an educational centre, and the growth of its population of recent years has been rapid. The export trade to Asia Minor and Central Asia is carried on by the Tatars. Leather, soap, gunpowder, and candles are made here. The university, Kazan's chief glory, was founded by Alexander I., and has a fine library and observatory and upwards of 1,000 students. The city is the see of a Greek archbishop, and contains an image of the Virgin which works miracles, and a sacred tower called the Sumbek.

Kazi-Kumukh, Caucasian aborigines, who call themselves *Lak*, and who appear to be a branch of the Lesghians. They were the first people of the Caucasus to adopt the Mohammedan religion, and from this circumstance received the title of *Ghasi* (whence *Kazi*), Champions of the Faith; *Kumukh*, the second part of their name, indicates the chief place in their territory, which lies in Central Daghestan. The Lak language, extremely harsh and guttural, is spoken by about 30,000 persons in a district 800 square miles in extent.

Karvin (CASVEEN), a Persian town situated midway between Teheran and Resht. Since the opening of the Transcaucasian Railway it has gained in importance. The manufacture of brocade and velvet is carried on here, and horses and camels are bred.

Kea. [KAKA.]

Kean, EDMUND (1787-1833), one of the greatest of English tragedians, was the son of a certain Anne Corey, who was said to be descended from Savile, Lord Halifax (q.v.). In 1801 he played in *King John* at Drury Lane with J. P. Kemble and Mrs. Siddons; but soon after he ran away, and, while acting as a tumbler in Saunders' circus, broke both his legs. In 1806 he made an appearance at the Haymarket, but, being refused an engagement

by Kemble, betook himself to the provinces, acting again with Mrs. Siddons. It was not till 1814 that he obtained his first important engagement in London. His appearance at Drury Lane in that year as Shylock was perhaps the most successful *début* of a great actor. During this season he also played Richard III. (probably his greatest part), Hamlet, Othello, and Iago. His acting was highly appreciated by judges such as Hazlitt and Coleridge. He also played in the provinces these and parts in modern plays, and on Kemble's retirement in 1817 was recognised as king of the stage. In April, 1820, he impersonated Lear with success, and in the same year he paid his first visit to America, where at New York, Philadelphia, and Boston he repeated his successes. The irregularity of his private life temporarily interrupted them. In 1825 he was howled down in London and in several Scotch towns, and in America also, his life even being in danger at Boston. In 1827, however, he reappeared at Drury Lane, and in the same year began an engagement at Covent Garden, which lasted for two years. He then returned to Drury Lane, but now began to lose his memory. He died in 1833.

Kean, CHARLES JOHN (1811-68), the second son of Edmund, was born probably at Waterford, and educated at Eton. He quarrelled with his father with regard to his treatment of Mrs. Kean, but afterwards played with him. In 1827 he made his *début* at Drury Lane in *Douglas*, and was fairly successful, and first acted with his father at Glasgow in October of the following year, Edmund playing Brutus and his son Titus in Howard Payne's *Brutus*. In 1829 Charles Kean acted in Holland, and in the following years played with some success in America his father's great part of Richard. In 1838 Charles Kean declined an engagement offered him by Macready, and the following year again visited America. In 1842 he married Ellen Tree, with whom he was playing in *Romeo and Juliet* at the Haymarket. After an engagement at Drury Lane and a third American visit the Keans reappeared at the Haymarket for several seasons. In 1850 Kean became part manager of the Princess's, and in the following year as sole manager began his spectacular revivals, among which were *King John*, *Macbeth*, Byron's *Sardanapalus*, and *King Henry VIII*. In 1859 he gave up the management of the Princess's, and in the same year a public banquet was given in his honour. In 1861 he began a season at Drury Lane, and after his farewell next year went round the world. In 1866 he again appeared in London, and took leave of the stage at Liverpool in 1867, in his best part, Louis XI. (Boucicault).

Keary, ANNIE (1825-79), novelist, was born at Bilton Rectory, Yorkshire. After publishing several children's books, she began novel-writing, *Castle Daly* (1875) being perhaps her best effort. She was also the author of *Early Egyptian History* (she had spent the winter of 1858 in Egypt), and *The Nations Around*. Her last novel, *A Doubting Heart*, was finished by Mrs. K. Macquoid. A memoir of her was written by her sister Eliza, who collaborated with her in *Heroes of Asgard*.

Keats, JOHN, was born on the 31st October, 1795. His father, ostler in the livery stables of Mr. Jennings, at Moorfields, married his employer's daughter, and carried on the business after him. He died when his son was nine years old, and his widow soon married again, but unhappily. Separating from her husband, she retired to Edmonton, which therefore became the home of the poet, who was already at school at Enfield, where he formed a lifelong friendship with his master's son, Charles Cowden Clarke. Upon the death of his mother in 1810 he became ward of Richard Abbey, a tea-dealer, who apprenticed him to a surgeon at Edmonton named Hammond, and his next years were passed between the study of medicine and that of literature. He knew no Greek, but at school he had fallen under the fascination of the Greek spirit, as revealed in the stories of mythology. He now felt the influence of Spenser, and began to turn for inspiration to him and to the other writers of the Elizabethan age, rather than to the authors of the eighteenth century. Before long he quarrelled with Mr. Hammond, and in 1814 went to London to attend the combined courses of St. Thomas's and Guy's Hospitals. He passed his examination in due course at Apothecaries' Hall, but already recognised that his calling was to letters. Clarke introduced him to Leigh Hunt, at whose house he met many literary men. Haydon, J. H. Reynolds, Joseph Severn, and Charles Dilke became his close friends. Among his acquaintances were Shelley, Godwin, Wordsworth, Lamb, and Hazlitt. Several of his sonnets were published by Hunt in *The Examiner*, and republished, with other poems, in book form in 1817. He then went, for a time of solitary study, to the Isle of Wight, where he began *Endymion*. This poem he brought out in the following year, which was also marked by the composition of *Isabella* and by a walking tour in Scotland, the fatigues of which caused an affection of the throat that was never entirely cured. He returned to encounter harsh reviews in *Blackwood* and *The Quarterly Review*, but this did not prevent his beginning another poem, *Hyperion*, which, having written two versions of the earlier part, he laid aside as too Miltonic in tone. He now lived chiefly at Hampstead, where he became engaged to Miss Fanny Brawne. The engagement was not a happy one. His passion preyed upon a mind already fevered by ill-health and the "continual burning of thought." Yet the following year was a noble creative period. In it he wrote *The Eve of St. Agnes*, the *Ode on a Grecian Urn*, and *La Belle Dame sans Merci*. At the same time he composed the dialogue for a tragedy, *Otho the Great*—of which his friend Brown supplied the plot—his poem *Lamia*, and part of a comic "faery" poem, *The Cap and Bells*. At this point his work was broken by consumption. Ordered to Italy, he went to Rome with Severn, who nursed him tenderly until the end came on the 21st February, 1821. His epitaph is in the *Adonais* of Shelley, written under the false impression that the *Quarterly* article had killed him, but embodying a magnificent tribute to his genius and his love for nature. Much in his poems was immature, but as a whole they are without a rival in the glow of

feeling which cast the richer and more complex moods of modern life into classical forms, and in the wealth of imagery which fulfilled his aim "to load every rift with ore."

Keats, SIR RICHARD GOODWIN, naval commander, born in 1757, was educated at New College School and Winchester College, but seized an opportunity in 1770 of entering the navy. He served during the American Rebellion, at the capture of a French convoy from Martinique, in Keppel's action off Brest in 1778, in Rodney's relief of Gibraltar, and in Rodney's victory over De Langara. He was made commander in 1782. In 1803 he formed part of Nelson's command off Toulon, and was in 1804 detached on three occasions to exact satisfaction from the Dey of Algiers. He was afterwards employed in the Baltic, and, as rear-admiral, in 1807 brought home the Danish prizes from Copenhagen, but returned to the Baltic, and there continued to render valuable service. In 1810 he took command of the squadron off Cadiz, and in 1813 at Newfoundland. He died in 1825.

Keble, JOHN (1792–1866), Anglican divine and sacred poet, was born at Fairford, Gloucestershire, his father being vicar of a neighbouring village. By him John and his brother were educated, the former being elected scholar of Corpus Christi, Oxford, in 1806. Five years later he took a double first, and was elected fellow of Oriel. In 1812 he won the prizes for English and Latin essays, and in 1815 was ordained. He left Oxford in 1823, having been a college tutor for five years, and went to live at Southrop, where he held the cure of three small parishes. In 1825 Keble went to a curacy near Winchester, but left it to help his father. In 1831 he was appointed Professor of Poetry at Oxford, and held the chair for ten years. In 1836 he accepted the vicarage of Hursley, which had been previously offered him, and there passed the remainder of his life in the fulfilment of his parish duties and in study. Three years after his death, in 1869, Keble College, Oxford, was opened to commemorate his life and encourage his doctrines. Newman declares that Keble was "the true and primary author" of the Oxford Movement. The collection of hymns embodied in the *Christian Year* was published in 1827, and their popularity has seldom been exceeded. Upwards of a hundred editions of the work have been published. In 1836 he published an edition of Hooker, which, revised by Deans Church and Paget, remains the standard edition; and he also contributed to the *Library of the Fathers*. Seven of the *Tracts for the Times* were from Keble's pen, the most notable being that *On the Mysticism Attributed to the Early Fathers*. His poetry lectures were published in Latin; and in 1846 *Lyra Innocentium*, a book of religious poems, valued by some critics more highly than the *Christian Year*, were written to add to the profits of the latter, which were devoted to the restoration of Hursley Church. In 1863 was published his last important work, *The Life of Thomas Wilson, Bishop of Sodor and Man*, whose name is familiar to readers of Matthew Arnold.

Kedge, or **KEDGE ANCHOR**, a small anchor often used to keep a ship steady and clear of her bower anchor while riding in harbour. It is also used for warping a ship. For this purpose it is carried out in a boat and dropped, and the ship is then hove up to it, when, if necessary, it is weighed and the operation is repeated. In the old days the largest kedge for a 100-gun ship weighed $10\frac{1}{2}$ cwt., and a small brig's kedge 2 cwt.

Keeling, or **COCOS ISLANDS**, a coral group in the Indian Ocean (lat. $12^{\circ} 5' S.$, long. $96^{\circ} 53' E.$), were discovered in 1699 by the navigator who gave his name to the largest islet. They form a ring round a lagoon only approachable by ships on the north side, and as they abound in cocoa-palms and good water form a convenient station. The English took possession of them in 1857, and the inner basin is called Port Albion.

Keene, **CHARLES SAMUEL**, was born at Hornsey in 1823, being the son of a solicitor in whose footsteps he was trained to follow. A marked gift for drawing led his mother to transfer him to an architect's office, whence he passed to the workshop of the Whympers, famous wood-engravers. His apprenticeship over, he at once found work on *The Illustrated News*, *Once a Week*, and other papers. For ten years he had been an occasional contributor to *Punch*, but did not join the staff until 1860, when he to some extent filled the gap left by John Leech. He died in 1891.

Keeper of the Great Seal, another name for the Lord High Chancellor of England, who is invested with office by the delivery of the Great Seal into his care. This Keepership is occasionally put into commission.

Keewatin, a name given to the district lying N. of Manitoba, E. of Lake Winnipeg, and W. of the coast of Hudson's Bay, and extending N. as far as the 55th parallel of latitude. It has been cut into for the purpose of enlarging Manitoba and Ontario, but has still an area of 280,000 square miles. The inhabitants consist of a few scattered Eskimos and trappers, under the rule of the Lieutenant-Governor of Manitoba. Cultivation for the most part is impossible, but there are natural growths of timber and mineral resources as yet undeveloped. Fishing in the lake and rivers, especially the mouth of the Saskatchewan, is successfully carried on. Norway House, a great centre of fur trade, lies in the N. of this region.

Kei, **THE GREAT**, a river of South Africa which, rising in the Storm Bergen, reaches the ocean at Cape Morgan, and during the latter portion of its course forms a boundary between Cape Colony and Kaffraria. This demarcation is now, however, more nominal than real, seeing that the Transkei, which includes Fingoland, Gealekeland, and other tribal areas, is governed by a magistrate appointed from Cape Town.

Keighley, or **KEITHLEY**, a market-town in the West Riding of Yorkshire, standing on the River Aire, 9 miles N.W. of Bradford, whence it is reached by the North Midland Railway. It is a growing and

prosperous place, owing to the development of the worsted and cotton manufactures and the production of washing machines. There are good public buildings, a grammar school, and a mechanics' institute. Pop. (1901), 41,965.

Keim, **THEODORE**, born at Stuttgart in 1825, and educated at Tübingen, entered upon a pastoral career first at his native place and then at Esslingen. In 1860 he became Professor of Theology at Zürich, being transferred later on to Giessen, where he died in 1878. His earliest works deal with the history of German Christianity, or take the form of sermons, but stirred by the Rationalistic criticism of the day, he devoted his later efforts to the building up of a historical character of Christ. After two preliminary essays he brought out his great treatise, *The History of Jesus of Nazareth*.

Keir's Alloy, an alloy of copper, zinc, and iron, formed by melting the ingredients under powdered coke. It is hard, tenacious, and ductile, so that it can be readily worked, while it suffers little alteration by exposure to atmospheric influences.

Keith, **JAMES**, **FIELD-MARSHAL**, was born at Kincardine in 1696, being of a noble Scotch family. He joined the Pretender, was wounded at Sheriffmuir in 1715, but escaped to Spain with his brother, the last Earl Marischal, and there served for ten years in the Irish brigade. He transferred his services to Russia, fought gallantly against the Turks at Otcchakof, and also against the Swedes, rising to the position of field-marshal, a rank which he retained, when, disgusted with Russian jealousies, he put himself at the disposal of Frederick the Great. He was highly appreciated by that warrior, and took part in the battles of Losowitz and Rossbach and the sieges of Prague and Olmütz, being killed in 1758 at Hochkirchen.

Keith, **HON. GEORGE KEITH ELPHINSTONE**, first Viscount, was born in 1747, and posted in 1775. He was promoted to flag-rank in 1794, and took part in the Glorious First of June victory, when he lost a leg. In the following year, with a squadron, he reduced the Cape of Good Hope. In 1796 the Dutch attempted to retake it, but their expedition, after some parley, surrendered to Sir George. In consequence of this he was in 1797 created Baron Keith in the peerage of Ireland, and was soon afterwards given a post in the Channel Fleet. In 1799 he was promoted to be vice-admiral and commander-in-chief in the Mediterranean. He died in 1823.

Kel-Ahamellen, a large division of the northern Tuaregs, who formerly occupied the whole of the Ahaggar plateau, North Central Sahara. Here still survive fourteen independent tribes, all claiming direct descent from the Kel-Ahamellen; but the claim appears to be justified only in the case of the Kel-Ahamellen-wa-n-Taghert, who dwell on the Muydir plateau between Ahaggar and the Twat oasis.

Kelat, or **KHELAT**, the capital of Baluchistan, stands in a gorge nearly 7,000 feet above sea-level, on the flank of the Shah Mirdan. The position is

strong, but the citadel and mud wall are of little military value. There are fair bazaars, where a large trade is carried on with surrounding tribes, but arms are the only local articles of manufacture. The climate is healthy and dry, and many European fruits and vegetables thrive here. It was taken by the British in the Afghan War of 1839, but given back. In 1854 the Khan was subsidised. Since then the subsidy has been increased, and the present Khan is, in all important matters, amenable to the advice of the Agent to the General-Governor in Beloochistan (q.v.).

Kel-Gueres, a chief branch of the Aïr (Asben) Tuaregs, Central Sahara, who, with the kindred Itisân, form a confederacy distinct from and hostile to the Kel-Owi. They reached this region from the north early in the 18th century; but about the year 1835 were driven by the Kel-Owi farther south and west in the direction of the Awelimmeden Confederacy. The Kel-Gueres are full-blood Tuaregs, and very warlike, fighting on horses and camels, armed with lance, sword, dagger, and an enormous shield of ox or antelope hide. The confederacy numbers about 25,000 souls, and can muster about 5,000 mounted warriors.

Keller, GOTTFRIED, was born near Zürich in 1819, and studied painting for some years in Vienna. He felt a vocation later on for literature and politics, became State Secretary for his canton in 1861, and brought out several volumes of short tales, poems, and romances. Chief among his works are *Der Grüne Heinrich*, *Sieben Legenden*, *Züricher Novellen*, and *Martin Salander*. He died in 1890.

Kel-Owi, the dominant Tuaregs of the Aïr or Asben oasis, Central Sahara, which they reached from an unknown region in the north-west about 1750. Here they partly supplanted, partly amalgamated with, the Negro (Hausa) aborigines from Sudan; so that the Kel-Owi, although claiming to rank with the noblest of the Imoshagh peoples, are no longer of pure Tuareg stock; hence their dark complexion and other traces of black blood. But the Kel-Owi Confederacy, of which the chief divisions are the Irholan, Kel-Azaneres, Ikezkezan, Kel-Tafidet, and Kel-Fares, is very powerful, controlling the political and commercial relations throughout south Central Sahara, and capable of mustering at least 10,000 armed warriors mounted for the most part on swift dromedaries. The total population certainly exceeds 50,000, a very large number in this thinly-peopled region.

Kelp, the ash of various seaweeds prepared on the coasts of Scotland, Ireland, and Brittany, formerly as a source of carbonate of soda and now mainly for iodine. The chief algæ employed are the "cut weeds," *Fucus vesiculosus* (bladder-wrack), *F. nodosus* (knobbed-wrack), and *F. serratus* (black-wrack), which are cut from the rocks between high- and low-water marks, and the "drift-weeds," *Laminaria digitata* (tangle), and *L. saccharina* (sugar-wrack). They are dried in the sun, and then, according to the more economical modern processes, destructively distilled. About 20 tons of sea-weed yield a ton of kelp. Drift-weed kelp will

yield from 8 lbs. to 13 lbs. of iodine per ton; but cut-weed kelp much less. Nearly half the ash is insoluble, the soluble portion including 20 to 25 per cent. of potassium chloride, 10 to 12 per cent. of potassium sulphate, and 5 per cent. of sodium carbonate, besides other salts of sodium and magnesium. At the beginning of the 19th century kelp was the main source of sodium carbonate, and some 20,000 tons were made annually in Scotland, its value being £20 per ton. On the introduction of Leblanc's process for preparing sodium carbonate from common salt the value of kelp fell to £2 a ton; but it rose in value as a source of iodine. The total production of kelp in the British Isles is now from 7,000 to 10,000 tons annually, and its value about £4 per ton.

Kelpie, a malignant water spirit, said to appear in the shape of a horse, especially during storms, as a presage of death by drowning.

Kel-Rhela (KEL-ERHLA), a noble Tuareg tribe, the most numerous and powerful of all the peoples of the Ahaggar plateau. They play a dominant part in the Ahaggar Confederacy, whose *amghâr* (supreme chief) is always a member of the Kel-Rhela group. Under them are numerous servile tribes, who do all the work, while the nobles attend exclusively to trade, war, and plunder. Without their consent no traveller can safely enter the Ahaggar district, and they also levy blackmail on caravans passing through their territory.

Kelso, a market-town in the county of Roxburgh, Scotland, standing on the north bank of the Tweed opposite the confluence of the Teviot, 22 miles from Berwick. The abbey was founded by David I. in 1124, but it was destroyed by Lord Hertford in 1545 with the exception of the fine Romanesque Church with its tower 90 feet high. This was used for Protestant worship until 1771, but it is now preserved merely as an ancient monument. The streets of the town, radiating from a central square, are well laid out, markets for grain, etc., are held weekly, and there are some factories of boots, woollen and linen goods, and iron. The North-Eastern and North British Railways have a station here. Floors Castle, the seat of the Duke of Roxburgh, is at the north-west extremity of the town.

Kelt. [SALMON.]

Kel-Tinalkum, a free but not a noble Tuareg tribe of the Azjar country, North Central Sahara. They take their name from the old fortified town of Tinalkum, the ruins of which are still seen south of El-Barkat on the caravan track between Ghat and Janet. After the capture of this stronghold they dispersed in all directions, and many are now found in the oases of the Wady Otba, Fezzan. At present they are chiefly occupied with trade, and many of the caravans between Tripoli and Central Sudan are equipped and escorted by this tribe. Although very numerous and armed with muskets, the Kel-Tinalkum recognise the political supremacy of the noble Orâghen Tuaregs.

Kemble, CHARLES, brother of JOHN PHILIP (q.v.), was born in 1775, and got employment in the Post Office, which he abandoned in 1792 for the family vocation. In 1803 he joined his brother at Covent Garden, and succeeded him in the management, thereby incurring great pecuniary burdens. As an actor he excelled in high comedy and in the middle range of Shakesperian types, such as Malcolm, Macduff, Aufidius. In 1840 he gave up the active exercise of his profession, and was appointed examiner of plays. By his marriage with Mlle. De Camp he became the father of JOHN MITCHELL (q.v.); of FRANCES ANNA (Mrs. Butler), a gifted actress and poet, who survived until 1892; and of ADELAIDE (Mrs. Sartoris), who displayed great musical abilities and died in Italy a year before her sister.

Kemble, JOHN MITCHELL, son of Charles and nephew of John Kemble, the famous actors, was born in 1807. Educated by Dr. Richardson, he acquired a taste for philology, and, winning an exhibition at Bury St. Edmunds School, went up to Trinity, Cambridge, where his conduct was erratic but not vicious. He was rusticated, and, joining the Spanish patriots, enjoyed some strange experiences, but ultimately returned to take his degree in 1830. In Germany, where he married a professor's daughter, his early prepossessions returned, and he took up the study of Anglo-Saxon with fervour, publishing in 1833 the *Poems of Beowulf*, with a glossary and commentary. This was followed in 1839-41 by his *Codex Diplomaticus Aevi Saxonici*, and in 1844 by *The Poetry of the Codex Vercellensis*. His most valuable work, *The Saxons in England*, was issued in separate volumes between 1849 and 1856. He spent six years in North Germany investigating the archæology of the Teutonic race, adding many interesting objects to the collection of antiquities at Hanover. He died in 1857.

Kemble, JOHN PHILIP, was born in 1757, and his father, a provincial actor, destined him for the Roman Catholic priesthood. The hereditary instinct however, prevailed, and in 1776 he made his *début* on the stage at Wolverhampton. In spite of physical defects, he steadily gained ground with the public until, in 1783, through the previous success of his gifted sister, Sarah [SIDDONS], he secured the opportunity of appearing in *Hamlet* at Drury Lane. His position as Garrick's successor was speedily established, and, though he lacked perhaps fire and dash in action, yet in the personation of characters in which concentration and dignity are the essentials, he was unrivalled. As Coriolanus, Julius Cæsar, and Macbeth he touched the highest level of dramatic art. In 1790 he plunged into the more hazardous venture of management, and during the two or three years that he held possession of Drury Lane effected some useful reforms, but resigned owing to disagreement with Sheridan and other proprietors. In the following year he took a similar interest in Covent Garden, but the fire of 1808, the O.P. riots, and the want of business capacity, involved him and his brother Charles, with whom he was associated, in heavy losses and much trouble. Kemble retired from business in 1817, and lived for six years in

privacy, dying at Lausanne in 1823. He introduced into the theatre sound principles of archæology, and materially raised the social status of the actor. His own dramatic productions possessed little merit.

Kempfenfelt, RICHARD, British naval commander, son of a military officer, a naturalised Swede, was born at Westminster in 1718, and, though he entered the navy in 1730, did not become a lieutenant till 1741 and a captain till 1757. He commanded the *Elizabeth*, 64, in Pocock's actions with D'Aché in 1758-59, and at Masida, and was captain of the fleet under Hardy in 1778, and under Geary and Darby. Made rear-admiral in 1781, he commanded a squadron which scattered a French convoy escorted by a powerful fleet, and captured several of the merchantmen. In the following year he shifted his flag to the *Royal George*, 100, and off Brest, with Admiral Barrenston, fought another action, which resulted in the capture of two line of battleships and eleven transports. His flagship, proving leaky, was ordered to be careened at Spithead, and, this operation being improperly performed, she, on the 29th of August, 1782, capsized, and went down with the admiral and above 1,200 persons, of whom 300 were women. Only about 300 were saved. A monument in memory of this awful catastrophe was set up in 1783 in the churchyard at Portsea. Kempfenfelt was not only a brave, but also a scientific officer, and his death was a great loss to the service.

Kempis, THOMAS À, is the name by which THOMAS HAMMEREKEN (MALLEOLUS), the son of a poor peasant, born at Kempen, near Düsseldorf, about 1380, became famous throughout the Christian world. His career was placid enough. Sent by his mother to school at Deventer, he came under the influence of Groot and Radewyn, but his bent was to study and retirement, rather than to mission work, and so he entered the convent of Mount St. Agnes at Zwolle, where he ended his days as sub-prior in 1471. His days were spent in the laborious task of the copyist, in the composition of a history of the monastery, and lives of Groot and Radewyn, and in the writing of a number of little simple tractates on monastic habits. None of these works gave indications of the power to be displayed in the marvellous embodiment of Christian precept and practice known as the *Imitatio Christi*. It has been conjectured that Thomas merely transcribed these pages from some ancient manuscript, or on behalf of some contemporary author, and the Benedictines have tried hard to vindicate the claims of John Gerson. Nothing, however, has been as yet adduced to deprive À Kempis of his credit, and the form of pietism developed in the book accords with the gentle mysticism, the freedom from ecclesiastical ambition, and the self-effacement of the poor monk of St. Agnes.

Kempten (CAMPODUNUM), a city of Bavaria, Germany, situated on the Iller, 64 miles distant from Augsburg by rail. The old town, called *Stifts-stadt*, from the abbey round which it clusters, stands on a hill, and is nearly surrounded by the

newer quarter that has been built on the plain below. It has the usual institutions of a district capital, as well as a public library and a Latin school. Woollen, cotton, and linen goods are the chief industrial products.

Ken, THOMAS, Bishop of Bath and Wells, was born at Little Berkhamstead, Herts, in 1637, and was educated at Winchester and Oxford. Izaak Walton, who married his step-sister, had considerable influence over his boyhood. He held various preferments, and in 1672 settled down at Winchester as Prebendary, fellow and chaplain to the bishop. In a *Manual of Prayers for the Use of the Scholars* appeared the two famous morning and evening hymns, "Awake, my soul," and "Glory to Thee, my God, this night." In 1688 he was one of the seven bishops who refused to publish James II.'s Declaration of Indulgence, and he went to the Tower. He refused, however, to take an oath of allegiance to William, and so was excluded from his see, passing his declining years in meditation and peace at Long-leat, Lord Weymouth's seat, where he died in 1711.

Kendal, or **KIRKBY KENDAL**, a market-town and municipal borough in Westmoreland, on the right bank of the Kent 20 miles N. of Lancaster, with which it is connected by the London and North-Western Railway. It was the earliest centre of woollen manufactures, Flemish weavers having settled there in the reign of Edward III., and it still produces heavy fabrics. Among the public buildings are an ancient church, a well-endowed grammar school, a town hall, and court house. Until 1885 the borough sent a member to Parliament, but it now forms part of a county division. Pop. (1901), 14,183.

Keneghez, a branch of the Uzbek Tatars, Shehr-i-Sebz district, Bokhara, Sunnite Moham-medans, as renowned for their courage as the women are for their beauty. Originally a subdivision of the royal Manghit tribe, of which the reigning Bokhara family is a member, the Keneghez detached themselves from that connection about the beginning of the nineteenth century; but the independent state which they then established was reduced by the Russians and restored to the Khanate of Bokhara in 1868. Five divisions: *Kairasaly*, *Achamaily*, *Tarakli*, *Chekkhat*, and *Abakly*, partly settled, partly still nomads.

Kenia, MOUNT, is situated in Central Africa, a few miles S. of the Equator, about midway between Lake Victoria Nyanza and the sea, and nearly in the centre of the territories of the British South Africa Company. The summit is crowned with perpetual snow, and the crater wall rises to a height of 16,000 feet, the higher peaks stretching up 3,000 feet beyond. Count Teleki ascended to a considerable height in 1887.

Kenilworth, a market-town in Warwickshire, $4\frac{1}{2}$ miles N. of Warwick, on a branch of the London and North-Western Railway. It is an ancient place, deriving its name from Kenulph, King of Mercia, and containing ruins of a 12th-century abbey, a fine church, and a grammar school. The castle, however, is the most interesting feature, not

only because of its picturesque beauty, but owing to the romance with which Scott has associated its name. The older portions date from Henry I., and Elizabeth was entertained there by the Earl of Leicester in 1575. Kenilworth enjoys some trade in agricultural produce, and has some factories for ribbons, watches, combs, and chemicals. Pop. (1901), 4,544.

Kennan, GEORGE, was born in 1845. He got his first knowledge of Russian and Asian life as a pioneer telegraphist. His chief work, the account of his travels and adventures in 1885-6, is "Siberia and the Exile System."

Kennedy, JAMES, a grandson, on his mother's side, of Robert III. of Scotland, was born about 1405, and trained on the Continent for the priesthood. In 1437 he was made Bishop of Dunkeld, where he showed much vigour and ability, and on being transferred in 1440 to the see of St. Andrew's he pursued his efforts for reforming the Church, and won the confidence of James II., who appointed him Chancellor. His advice materially aided the king in resisting the encroachments of the Douglas clan. In 1460 he became one of the Council of Regency, and did much to advance Scottish interests. The College of St. Salvator was founded by him, and he also built a ship for trading purposes at the then enormous cost of £10,000. He died in 1466.

Kennicott, BENJAMIN, CANON, D.D., was born in a humble station in 1718. His youthful abilities found patrons, who sent him to Exeter College, Oxford, where he soon made himself a name for biblical scholarship. He wrote in 1753 a treatise pointing out the imperfections of the Hebrew texts of the Scriptures, and money was raised to enable him to revise the Old Testament. This task occupied his whole life, for he brought out his book in 1776 and died in 1783, having collected between six and seven hundred manuscripts.

Kensington, an extensive suburban parish of West London, including Notting Hill and Kensal Green to the N., Brompton, Chelsea, and Earl's Court, to the S. It is often subdivided into Kensington proper, South Kensington, West Kensington, and North Kensington. The manor and village out of which it grew lay wholly W. of the palace of Kensington and the gardens surrounding it, now a public park, these latter being in the parish of St. Margaret's, Westminster. The existing High Street still retains some of its primitive character. William III. bought from Lord Chancellor Finch the residence in which he died and Queen Victoria was born, and for fifty years it was a favourite abode of royalty, whence Kensington became known as the Old Court Suburb. The Duchess of Portsmouth formerly occupied a house close to the same site. Holland House at the further extremity of the former village still preserves the memory of the Riches and Foxes, as Campden and Argyle Houses, the tenure of the manor by the Campbell and the Hicks families. The quarter is now crowded with palatial villas, and is much affected by literary and artistic celebrities. Pop. (1901), 173,069.

Kent, a county occupying the south-eastern corner of England, being bounded N. by the Thames and the North Sea, E. and S.E. by the Straits of Dover, S. by the English Channel, S.W. by Sussex, and W. by Surrey. Its extreme length from Surrey to the North Foreland is 65 miles, its extreme width from Sheerness to Dungeness 35 miles, and its area 1,570 square miles. The surface is undulating, as the North Downs, a chalk range of from 3 to 6 miles in breadth, traverses the district from S.E. to N.W. Below this, towards the Sussex border, stretches the Weald, once a vast forest and still retaining much timber, but bearing good crops of cereals and roots in a marly soil. Further S. the expanse of Romney Marsh is only suitable for pasture, and supports great numbers of sheep. The whole of this tract is drained only by small streams, such as the Rother, the Eden, the Teise, the Bealt, and the Little Stour. N. and E. of the Downs, rich deposits of alluvial soil occur in the valleys of the Thames, the Medway, and the Swale, and their fertility has won for the neighbourhood its title of the "Garden of England." The Stour valley is also fairly productive, but the soil of the Isle of Thanet is light, and at Sandwich the chalk downs begin. Hops and fruit are largely cultivated in the central districts. Manufactures are few, cement and bricks on the Medway, and paper on that and other rivers being the chief; but ship-building is carried on at various points, and the Government works at Woolwich, Deptford, and Chatham employ many hands. Deep-sea and shore fishing yield considerable profits; Ramsgate, Dover, and Rye, maintaining large fleets of smacks. The traffic with the Continent through Dover and Folkestone is another source of gain, and of late years Folkestone, Westgate, Hythe, and Deal, have grown into fashionable summer resorts, whilst Margate retains its old popularity. Railway communication is provided by the South-Eastern and Chatham line with its branches. [MAIDSTONE, CANTERBURY, CINQUE PORTS.] Pop. (1901), 1,351,849.

Kentigern, or ST. MUNGO, the son of a British or Culdee prince, is said to have been born somewhere N. of the Forth about 514. He received his education at the monastery of St. Serf, near Culross, and became a missionary preacher on the spot now occupied by Glasgow, where he became bishop. The jealousy of the local sovereign forced him into exile, and, settling in Wales, he founded the see of St. Asaph; but, being recalled about 560, he began the building of the cathedral, and ministered there until his death in 601.

Kentish Fire, a slang phrase for the expression of approval by clapping of hands and cheering. The exact origin of the expression is doubtful, but it is said to be derived from the sustained uproar by which Kentish opponents of the Catholic Relief Bills expressed their feelings at political meetings (1828 and 1829).

Kentish Glory, the nearest English ally of the silkworm. It is a moth about two inches across; the fore wings are brown. The hind wings of the male are yellowish, and those of the female

white with brown spots. The caterpillar lives on the birch. Its name is *Endromis versicolor* (Linn.).

Kent's Cavern, or HOLE, a cave situated in a small limestone hill near Torquay, in Devonshire. The bottom of the cave is formed of layers of stalagmite, red earth, and breccia, in which are found bones of various animals, such as rhinoceros, reindeer, wolf, and lion, as well as implements of flint and bone. There is also a layer of charred wood where, it is supposed, the early inhabitants of the cave had their fires. It was first explored for scientific purposes in 1825, but received little attention till 1864, when it was explored by a committee of the British Association under the direction of Mr. Pengelly, at a cost of over £1,900.

Kentucky, one of the United States of America, lying between Ohio, Indiana, and Illinois to the N., Missouri to the W., Tennessee and Virginia to the S., and Virginia and West Virginia to the E., with an area of about 40,000 square miles, the length from E. to W. being 458 miles, whereas the greatest breadth, N. to S., is only 171 miles. The surface consists of a great plateau sloping easily down from the Appalachian range on the S.E. to the valleys of the Ohio and Mississippi on the N.W. The highest portions (Pine Mountain and Cumberland Range) do not much exceed 3,000 feet, and the lowest level attained is about 600 feet. The flats on the margin of the Ohio are mostly covered with wood, but a strip of excellent soil, "the Blue Grass region," extends right through the centre of the state, and reaches its maximum fertility beyond Green River. To the N.E. and S.W. of this belt lie great coalfields. All the rivers—among them being Big Sandy, Licking, Kentucky, Salt, Green, Cumberland, and Tennessee—flow N.W. to the Ohio, and in some cases have cut their way deep through the limestone rocks, forming remarkable caverns, of which the Mammoth Cave is a renowned specimen. There are, too, many subterranean streams. Almost every kind of vegetable produce is grown, including cotton, tobacco, maize, and fine fruits. The breeding of horses and cattle is, however, a still more profitable occupation. The vast forests covering more than half the state yield much valuable timber. Coal is worked profitably, and the iron ores are of good quality, whilst petroleum has recently been obtained in considerable quantities. Frankfort is the capital, but Louisville is the most important and Lexington the oldest of the towns, among which Covington, Newport, Paducah, and Maysville deserve mention. Originally part of Virginia, Kentucky became independent in 1789, and was admitted to the union three years later. Schools are well organised and supported, and the railway system has developed widely since 1870.

Keokuk (THE GATE CITY), an important commercial centre, being the capital of Lee County, Iowa, U.S.A., is situated on high ground above the Mississippi, 2 miles N. of the confluence of the Des Moines river. Seven railways meet here, and a canal to avoid the rapids secures convenient water carriage, and so a great business in pork and other western products has grown up in the last fifty

years. It is built chiefly of brick, and has spacious streets, fine public buildings, and a medical school.

Kepler, JOHN, was born of noble but needy parents at Weil, a little town of Würtemberg, in 1571. He was a delicate seven-months' child; but in spite of disease and family troubles, he acquired some rudiments of learning, and the Duke of Würtemberg sent him to school, whence he passed to the university of Tübingen. Here he fell under the influence of Moesthin, a strong Copernican, and wrote a treatise to prove the diurnal rotation of the earth upon its axis. In 1593 he became Professor of Astronomy at Grätz, and, his attention being directed to the apparent want of any system in the relative size of the planets and their orbits, he spent some years in fruitless endeavours to determine the ratios that they bore to one another. The rather fanciful results of his investigations were published in 1596, and attracted the notice of Galileo and Tycho Brahe, the latter of whom offered him a sort of partnership at Prague, the Emperor Rudolph of Austria guaranteeing the expenses. The two then set about compiling the *Rudolphine Tables*; but Tycho died, and the Imperial promises were not kept, so that Kepler reverted to his former labours, and brought out in 1609 his *Astronomia Nova*, in which, from his observations of the planet Mars, he deduces that the orbit is elliptical, and that the radius-vector between the sun and the planet describes equal areas in equal times. In 1619 he gave to the world his third and most important law—viz., that the squares of the periodic times are proportional to the cubes of the mean distances between the planets and the sun. The *Harmonia Mundi*, enunciating this discovery, was dedicated to James I. of England, who in vain invited him to cross the seas. War, sickness, and the difficulty of getting his salary made his life wretched, and the death of his wife just as he obtained a professorship at Linz added fresh troubles. He worked on, however, effecting great improvements in the Galilean telescope, and bringing out in 1618 the first part of his *Épitome Astronomica Copernicana*, followed in 1628 by the *Rudolphine Tables*. The Duke of Friedland now became his patron, and he settled with his new wife at Sagan, filling the chair at Rostock. A journey to Ratisbon in 1630, in the hope of recovering the arrears of salary, brought on a fever, and he died of an abscess on the brain. Kepler's work amounted to thirty-three printed and twenty-two manuscript volumes, touching upon and illuminating every branch of cosmical science.

Kepler's Laws relate to the motions of the planets. The first two appeared in one of his writings published in 1609 at Prague, and the third one in 1619 at Augsburg. 1. The planets move in elliptical orbits with the sun in one focus. 2. In the motion of a planet round the sun the radius-vector (the line drawn from the sun to the planet) sweeps out equal areas in equal times. From this it follows that the velocity of the planet must be greater when it is nearer to the sun than when it is farther off. 3. With regard to different planets, the squares of their periodic times (the times taken

to go once round their orbits) are proportional to the cubes of their mean distances from the sun—the mean distance from the sun being taken as half the length of the major axis of the ellipse. Since the discovery of the universal law of gravitation, Kepler's second and third laws have been mathematically deduced from the first. Previous to the time of Kepler it had been considered that the planets moved in circles round the sun with uniform velocity; hence these brilliant discoveries practically formed the basis of modern astronomy.

Keppel, HON. AUGUSTUS, first Viscount, naval officer, was born in 1725. He went round the world in the *Centurion* with Anson, and in 1744 was made commander, and, later in the same year, captain. He was present at the battle of Quiberon Bay in 1759, and assisted in the reduction of Belleisle. In 1762 he became a rear-admiral, and as such served in the West Indies, and in 1765–66 at the Admiralty. In 1770 he attained the rank of vice-admiral, and in 1778 that of admiral; and, in the last-mentioned year, soon after taking command in the Channel, he fought on July 27th an indecisive action with the Comte d'Orvilliers, off Ushant. In consequence of this he was tried by court-martial on charges of misconduct preferred against him by his second in command, Sir Hugh Palliser, but was honourably acquitted. In 1782 he was created Viscount Keppel and First Lord of the Admiralty. He died in 1786.

Ker, or CARR, ROBERT, Viscount Rochester and Earl of Somerset, a member of the family of the Kers of Fernihurst, began life as a page to the Earl of Dunbar, but was taken to London by Sir Thomas Overbury, and introduced to James I., in whose service he rose rapidly. He married the profligate Countess of Essex, and both he and his wife were tried for the murder of Sir Thomas Overbury in 1615, George Villiers now having taken the place of his predecessor in the royal affections. Though their guilt was proved, the fear of discreditable revelations induced the king to let them escape and even grant them a pension of £4,000 a year. Their agents, however, were executed. The Earl of Somerset died in 1645.

Keratitis, the term applied to inflammation of the cornea of the eye. The disease occurs in several forms; *vascular keratitis* tends to involve a large portion or the whole of the surface of one or both corneæ, and may leave behind it considerable opacity with serious impairment of vision. The conjunctiva is affected, but the fact that something more than mere conjunctivitis is present is borne evidence to by the existence of what is known as a *circum-corneal zone*, a ring of congestion immediately surrounding the cornea in the sclerotic coat. Rest of the affected eye, cold applications, use of atropine, and counter-irritation are indicated; astringents should be withheld, and herein lies the importance of not confounding the condition with one of conjunctivitis. *Interstitial keratitis* occurs in children who are affected with inherited syphilis; this disease is associated with a peculiar condition of the teeth, and sometimes with deafness.

Suppurative keratitis is a very destructive disease, and produces great impairment of vision in the affected eye.

Keratoza, the group of horny sponges including those in which the skeleton is formed of fibres of spongin (or keratode). It includes the ordinary sponge of commerce. [SPONGE.]

Kerbela, or MESHED HOSSEIN, a town in the pashalic of Bagdad, Asiatic Turkey. It is situated on an old canal from the Euphrates about 60 miles S.W. of Bagdad, and 28 miles N.W. of the ruins of Babylon, and is enclosed within a wall with five gates. The mosque and tomb of Hossein or Hassan, son of Ali, the saint of the Shiite sect, attracts hither large Mohammedan pilgrimages.

Kerguelen's Land, or THE ISLAND OF DESOLATION, lies in lat. $49^{\circ} 54'$ S., long. $70^{\circ} 12'$ E., in the Indian Ocean, deriving its name from the French navigator who discovered it about 1772. It has a length of 100 miles, with an extreme breadth of 50 miles, and is rocky and sterile, but contains coal of some value. The coast is deeply indented, Christmas Harbour affording safe anchorage.

Kerman (KARAMANIA), a province of Persia, bounded by Khorassan and Afghanistan to the N. and N.E., Baluchistan and the Persian Gulf to the S.E. and S., and Laristan and Fars to the W. The area is about 60,000 square miles, much of the northern portion being a barren waste covered with saline incrustations. In other parts cotton, madder, saffron, tobacco, gums, fruit, and attar are produced in abundance. The hair of the goats and camels and silk are, however, the most valuable articles of commerce, and fine fabrics, shawls, and carpets are manufactured. Iron, copper, and sulphur are worked. Moghistan, the coast district to the E., belongs to Muscat.

Kerman, GHIRDJAN, or SIRJAN, the capital of the above, was formerly an important town strategically and commercially, standing in a plain among the mountains due N. of Murgab, and being protected by two hill-forts. It suffered, however, severely from the siege and subsequent sack by Aga Mahomed Khan in 1794, and has never recovered, though it still has some trade and a few industries.

Kermanshah, the capital of Persian Kurdistan, is on a tributary of the river Kerkhah (Choaspes), 280 miles S.W. of Teheran, in the province of Irak-Ajemi. It is fortified with a brick wall and towers, and the bazaars are well supplied. Fruit and cotton are grown and exported to Bagdad, as the town is on the caravan route between Persia and Turkey. Carpets and swords are the principal manufactures.

Kermes Mineral, a compound consisting of the sulphide of antimony (Sb_2S_3) mixed with varying quantities of the oxide (Sb_2O_3) and obtained by boiling ordinary sulphide of antimony with sodium carbonate or other alkali. It was formerly very largely employed and greatly prized for medicinal purposes, for which it is still used to a small extent.

Kernel, a popular term for the seeds (q.v.), especially when large and edible, in nuts and stone-fruits.

Kerner, ANDREAS JUSTINUS, was born at Ludwigsberg in Würtemberg in 1786, and was educated for the medical profession at Tübingen. He settled at Weinsberg, and in the intervals of practice amused himself by lyric compositions, which had a great success. Chief among these are *Travelling Shadows by the Magic-lantern Player*, and *The Visionary of Prevorst*, wherein he dealt with the phenomena of animal magnetism. He died in 1862.

Kerosene is a mixture of hydrocarbons, obtained as one of the products in the refining of crude petroleum, being that portion which distills over between the temperatures of 150° and 300° C. It is thus obtained as a colourless inflammable liquid of specific gravity .8, largely employed for purposes of illumination.

Kerry, a county in the province of Munster, Ireland, occupying an area of 1,810 square miles, in the extreme S.W., being bounded W. by the Atlantic, N. by the estuary of the Shannon, S. and E. by Cork and Limerick. The coast is broken by the bays of Tralee, Brandon, Kenmare, Dingle, and Ballynaskelligs, and dotted with islands, among which is Valentia, the starting point of some of the Atlantic cables. The surface to the S.W. is very mountainous and picturesque, Cairn Tual, the highest point in Ireland, attaining 3,404 feet. Further N. the soil in the valleys is rich, and, though the moist climate is unfavourable to cereals, other produce is abundant. Almost everywhere the rich pasture supports herds of the famous Kerry cattle. Lakes are an interesting feature of the county, and those of Killarney draw by their beauty crowds of tourists. Loughs Cara, Kittane, and Currane are also worth notice. The Blackwater is the chief river, but there are many others, such as the Roughty, the Laune, the Flesk, the Inny, and the Feale. Minerals are but partially worked, and coal occurs in thin seams only. Flags and slates are exported in some quantities. Fishing gives employment to a large number of the coast population. Pop. (1901), 165,391.

Kersey, a diagonal-ribbed strong woollen cloth. As a rule it is coarse, and is only used for those parts of liveries where there is most wear. The principal places of manufacture are the north of England, Germany, and France. A very fine make of Kersey is called Kerseymere or Cassimere.

Kertch (anc. PANTICAPÆON), a seaport and fortress in the government of Taurida, European Russia, at the E. extremity of the Crimea, and overlooking the Straits of Yenikale or Cimmerian Bosphorus. Founded in the 6th century by a colony from Miletus, the town became the centre of the kingdom of the Bosphorus, but was conquered by Mithradates, and ruled by kings until the 4th century, when it was annexed to the Eastern Empire. Later it was held by various Slavonic barbarians, and was ceded by the Tartars to the Genoese, who established a thriving commercial

settlement. The Turks held it from about 1500 to 1771, since which date it has been in the possession of Russia. Its importance then diminished, and it suffered through its capture by the allies in the Crimean War. There is still, however, a considerable export trade in corn, hides, and Russian produce, whilst to the archæologist the place will always be deeply interesting, though the famous museum was removed in 1854. The church of St. John, dating from 717 A.D., is a remarkable specimen of Byzantine architecture.

Kestrel (*Falco tinnunculus*), a common British raptorial bird, migrating southward in winter. The adult male is about a foot long,



KESTREL (*Falco tinnunculus*).

reddish-brown marked with black above, light rufous spotted with black below; head, neck, and rump, bluish-grey. The female is slightly larger, and has reddish plumage barred with black. The kestrel is also called the windhover, from its balancing itself in the air by the rapid motion of its wings, and stannel (said to be a corruption of stand-gale) because it always keeps its head to the wind. Kestrels are decidedly farmers' friends, for they prey chiefly on mice and insects. There are many closely allied forms, sometimes separated from the genus *Falco*, and placed in a separate genus or sub-genus, *Tinnunculus*.

Keswick, a market-town of Cumberland, on the river Greta and the London and North-Western Railway, 22 miles S. of Carlisle. Its proximity to Skiddaw and Derwentwater, and its connection with the Lakists, especially with Southey, make it a favourite resort of tourists. The town is trim and prosperous, and possesses a handsome Early English church. Woollen goods and agricultural implements are still made here, but the manufacture of lead pencils has dwindled since the exhaustion of the Borrowdale plumbago mine. The char fishery affords employment to the boatmen on the lake. At the neighbouring village of Crosthwaite is the grave of Southey. Pop. (1901), 4,451.

Ket, or KETT, ROBERT and WILLIAM, two brothers who carried on the business of tanners at Norwich, and put themselves at the head of the

movement against the enclosures of land and the spread of Protestantism during the rule of the Protector Somerset. They were men of ability and character, keeping their followers under considerable discipline. After defeating the Marquis of Northampton, they were routed and captured by Lord Warwick in 1549, and both were hanged on the Tree of Reformation, beneath which they held their tribunal.

Ketchup, CATCHUP, KATSUP, CATSUP, a name given to several sauces which are used with meat, fish, etc. Amongst the most common are mushroom, tomato, and walnut ketchup.

Ketones are a class of organic compounds, characterised by the presence of a CO group united to two hydrocarbon radicals, as, e.g., $C_2H_5 \cdot CO \cdot CH_3$, ethyl methyl ketone. If two such groups be present we obtain *diketones*, etc., many of which compounds are important in pure chemistry. *Ketones* may in general be prepared by the distillation of the calcium salts of organic acids as exemplified in the case of the simplest ketone—dimethyl ketone ($CH_3 \cdot CO \cdot CH_3$) or *Acetone* (q.v.)



If oxidised the ketones generally break up, yielding a mixture of acids, or of acids and other simpler ketones.

Kettering, a market-town of Northants, 13 miles N.E. of Northampton, on the Midland Railway. Its market privileges date from Henry III., and the church of SS. Peter and Paul affords a good example of the 15th century Perpendicular style. There are a town-hall, an endowed school, and other public institutions. Boots and shoes, brushes, clothing, agricultural implements, and velvet are the staple manufactures, iron being also worked in the neighbourhood. Pop. (1901), 28,653.

Kew (originally KAYOUGH), a village in Surrey, standing on the S. bank of the Thames 6 miles from Hyde Park Corner, and connected with London by several lines of railway and by steamboat services. It has thus become a favourite place of suburban residence, the fashion having been led by Frederick, Prince of Wales, who leased Kew House, which was purchased in 1789 by his son George III., and pulled down to make room for quarters for his children. The Botanical Gardens had been started before this by Lord Capel, and were improved by the Aitons and Sir Joseph Banks. In 1840 the nation took them over. They cover 270 acres. Kew Palace is never used now, but Kew Cottage is occasionally occupied by Royalty, and the quaint church on the Green has been the scene of several royal weddings. The stone bridge which connected Kew with Brentford has now been replaced by the fine "Edward VII." bridge built in 1904.

Key, or KI, the name of a group of islands in the Indian archipelago. It is situated 50 miles W. of Arru islands, and 70 miles S.W. of Papua in lat. $5^{\circ} 30' S.$, long. $128^{\circ} E.$, comprising the Great and Little Keys, Verdool, Keywatela, Ketember, and a few other insignificant islets. The exports are

trepan, tortoiseshell, and birds'-nests. Vegetation is very luxuriant.

Key, in *electricity*, is an instrument used for opening and closing circuits conveying small currents. An elastic strip of brass is fixed to a base at one end, and has a platinum point and an insulating button at the end. By pressing the button the point can be put into contact with a fixed stud, also tipped with platinum. Wires are attached to the strip, and the studs can thus be connected with or disconnected from each other at pleasure. In some keys two fixed contact pieces are provided, one above and one below the strip; the latter can then be brought into connection with either, thus connecting one wire with either of two others. The Morse telegraphic key serves the same purpose, but has the two contacts not one above the other, but at opposite ends of a lever pivoted near the middle. Double contact keys are used in testing for charging and discharging condensers, etc. Reversing keys, used with single needle, mirror, and syphon recording telegraph instruments, have two double contact keys on the same base. The two top contacts are connected together and to one pole of a battery, the two bottom contacts being connected to the other pole; the two levers are connected to line and earth or to some instrument. When both levers are up the battery circuit is open, but a current may be sent in either direction by pressing one or other of the buttons. In plug keys a conical hole is drilled in a plate of brass, which is then divided by one or more saw cuts passing through the centre of the hole; the pieces, being screwed to a base-board, may be connected or disconnected by inserting or withdrawing a taper plug which fits the hole.

Keyhole Limpets, or *Fissurellidae*, a family of univalve Mollusca (Gastropoda), of which the shell is low and conical in form; it differs from the true limpets by the fact that the apex of the shell is perforated by a keyhole-shaped aperture.

Keyne, ST., a pious Cornish virgin, said to have flourished at or near Liskeard towards the close of the 5th century. Her name is preserved in an ancient church and a well, the waters of which possess remarkable virtue. They confer supremacy in married life on whichever of a newly-wedded couple is the first to drink them. The legend is referred to by Fuller, and Southey made it the subject of a jocular ballad. It is given in detail by Cyrus Redding.

Keys, THE, or CAYS, a local name given to a number of low, sandy islands or reefs dotted about off the coast of Honduras, in the Bahamas, and as far north as the Florida side of the Gulf of Mexico. There is also a group so called in the Eastern Archipelago (*see above*).

Key West, one of the Florida Keys, lies 60 miles S. of the extremity of Florida, and possesses a good climate and fertile soil. Here is built Key West City, one of the most important military stations of the United States. Fort Taylor protects the harbour. Salt is made here in large quantities,

cigars are manufactured, and turtles are exported. The wrecks that constantly occur on the dangerous shoals give employment to the seafaring inhabitants.

Khaki, an earthy or clay colour largely used to dye the uniforms of soldiers. In the South African War (1899-1901) the British troops were clad in khaki, and the word came to be identified with the war as a whole.

Khami, a hill tribe, Upper Kuladen Valley, Arakan; a branch of the Burman race who have preserved their primitive customs and the worship of spirits and ancestry. They are skilful and industrious agriculturists, supplying tobacco, cotton, sesame, and other produce to the lowlanders. The Khami have a curious unwritten legal code, according to which all crimes may be punished by temporary or permanent slavery. Women have no rights, and are regarded as mere chattels owned by father, brother, or husband. The national name *Khami*, meaning "Men," has been changed by the lowlanders to *Kxe-myi*, "Dog-tails," in reference to an appendage to their costume.

Khampas, a group of Tibetan tribes now settled in the western province of Gnari-Khorsum, but originally from Kham (East Tibet), whence their name *Kham-pa*, "People of Kham;" not to be confounded with their present neighbours the *Khambas*, from whom they differ in many respects. They are a robust, well-made people, armed with guns and swords, and great marauders. Both sexes are constantly in the saddle, either raiding or pursuing the antelope and wild sheep. All are Buddhists, like most Tibetans; but the language differs greatly from the standard Tibetan, the roots being the same, while the prefixes and suffixes are altogether different. (H. Trotter, *Account of the Pundit's Journey in Great Tibet*, *Journal of the Royal Geographical Society*, 1877.)

Khampti (KHAMTI), a semi-civilised people of both slopes of the Patkoi range between the Brahmaputra and Irawady, and in the Sudiya district, Assam; are of Shan stock, originally from the Bor Khampti country about the headwaters of the Irawady; remarkably fair complexion, and in physique superior to all the surrounding peoples; are nominal Buddhists, possessing some culture; all read and write their Shan dialect and often Burmese, both languages being written in the Burmese character; endless tribal groups, each with its *gohain* (chief) and separate villages, and each known by the pattern of the men's waist-clothes. (T. T. Cooper, *The Mishmi Hills*, *passim*.)

Kharkov, a government of South Russia, forming a district of the Ukraines, and extending from 48° 30' to 50° 12' N. lat. and 34° 20' to 38° 20' E. long., with an area of 21,035 square miles. It consists of a plateau of medium elevation belonging to the Great Steppe, and is watered by the Donets, an affluent of the Don and its tributary the Oskol. The soil is fertile, and large quantities of grain and wine are produced; horses, cattle, and sheep are also extensively reared. The capital, Kharkov, 465 miles S. by W. of Moscow by rail, is the seat of

a bishop of the Greek Church, and is noted for its university, established in 1805, which has a library of nearly 60,000 volumes, a botanical garden, an observatory, etc. The restrictive measures adopted by the Government in consequence of the Nihilistic tendencies of the students have greatly impaired its educational efficiency. The fairs for cattle and wool are famous.

Khartoum, once the most populous town of the Eastern Soudan, is situated a little above the union of the Blue and the White Nile, 445 miles S.W. of Suakim. During the war with the Mahdi (1884-85) it was gallantly held by General Charles George Gordon (q.v.), who was slain, with the rest of the garrison, two days before the arrival of an army of relief (Jan. 26, 1885). In 1898 Kitchener overcame the dervishes and entered Khartoum. It is the site of a college, erected to the memory of Gordon, for the education of sons of leading natives.

Khas, a term originally meaning "Men," but now applied by the Siamese and Laotians to all the wild tribes of the border ranges; in this sense it answers to the *Moi* of the Annamese and the *Penong* of the Cambojans. But it is a word of too general application to have any ethnological value. There are Khas tribes everywhere in Indo-China, and the term enters into the composition of an immense number of tribal names, not only in this region, but also in South China and North-East India.

Khas, **KHOS**, a group of wild tribes of North Laos, in the mountains near the Mekhong river, north of Luang Prabang. They regard themselves as originally Chinese from the Tien-tsang Hills, Ta-li district, although MacLeod affiliates them to the Kuy of Camboja. The type appears to be more Chinese than Annamese, and they shave their head, leaving a pigtail in the Chinese fashion. They have a large number of silver ornaments chased with great skill and taste.

Khási and Jaintià Hills, an administrative district under the Chief Commissioner of Assam, covering 6,157 square miles, of which 2,160 square miles are British territory. The surface is a series of grassy plateaus. Limestone, lime, oranges, and potatoes are exported in large quantities to Bengal. The headquarters are at Chillong.

Khas-mu-tse, aborigines of Indo-China, numerous especially in the Kuy-Cheu uplands and in the Mekhong Valley about Muong Lini, on the frontier of Siam and Burma. Their language, distinguished by its harsh and hissing sounds, differs altogether from that of the surrounding Lao (Shan) peoples, and Colonel Yule thinks they may be of the same stock as the Miao-tse of South China. (Fr. Garnier, i., p. 369.)

Khassia (**KOSSYAH**), a large nation of South Assam, left bank of the Brahmaputra; of Tibeto-Burman stock, but speaking a distinct monosyllabic language, which presents several peculiar features; five well-marked dialects spoken by about 150,000 *Ahyi*, as the Khassias call themselves. They form a group of petty states occupying the whole of the

Khassia Hills, each under an elective chief, and all recognising the supreme authority of the Chief Commissioner of Assam, who resides at Chillong in their territory. The Khassias are still for the most part Nature-worshippers, rejecting the Brahman and their system of castes. The dead are buried under dolmens or cromlechs formed by four monolithic uprights supporting a fifth slab placed horizontally. The whole country is dotted over with groups of such monuments, which occur also in the neighbouring Jaintià and Naga Hills, and which are strictly analogous to the prehistoric monolithic monuments of Mauritania, West Europe, and Britain.

Khassonkés, a Negroid people of Senegal, who are a branch of the Soninkés of Mandingan stock. They occupy the Khasso district (whence their name), and extend along the Senegal river between the Faleme confluence and Bafulabé. Two main divisions—*Gadiagas* on the left and *Guidimakas* on the right bank of the river. The Khassonkés are generally regarded as the result of crossings between the Soninkés on the one hand and the Berbers and Fulahs on the other.

Khataks, a large division of the Afghan people in the southern part of the Peshawur district and in Kohat. Three main branches—*Tari*, with six sub-groups; *Taraki*, with thirteen sub-groups; and *Bolak*, with nine sub-groups; total population, about 100,000. The Khataks form a petty semi-independent state subject, not to the Emir of Afghanistan, but to the British rāj. Some have migrated to the Yusafzai territory farther north, where they form seven tribal groups, also subject to the English authorities.

Khátmádu, the capital of Nepal, is situated at the junction of the Vishnumati and Bághmatú rivers. The most conspicuous object is the Maharaja's palace, part of which is ancient. There are many fine temples.

Khatrans, a numerous people of Baluchistan, whose territory comprises the hills west of Dera Ghazi Khan. Four main branches—*Ganjura*, *Darawal*, *Hasani*, and *Nahar*, with thirty-two minor groups, and collective population, 50,000 to 60,000. The Khatrans are a pastoral people, owners of large herds, and wealthiest of all the Baluch tribes.

Khedive, the French form of a Turkish title, equals "prince," "lord," adopted by the Viceroy of Egypt in 1867, by Ismail Pasha, after his office had been made hereditary by his suzerain, the Sultan of Turkey. The title is old, being mentioned by Purchas (1625) in the form *Quitue*.

Kherson, a government of South Russia, extending over 27,515 square miles, and bounded by the Dniester on the W., the Dnieper on the S.E., and the Black Sea on the S. The southern portion forms part of the Great Steppe, but towards the north the surface becomes undulating. The northern and western districts are the most fertile. Cattle-rearing and agriculture are the principal industries. There are several German colonies. **KHERSON**, the capital, situated on the Dnieper, 19 miles from its

mouth, was founded by Prince Potemkin in 1778. The chief article of trade is timber; wool-cleaning is extensively carried on. John Howard, the philanthropist, died here.

Khiva, or **KHARASM**, a khanate of West Turkestan, situated between 37° 45' and 44° 30' N. lat., and 50° 15' and 63° E. long., and comprising nearly 25,000 square miles, about four-fifths of which are a sandy desert. It is bounded on the E. and N.E. by the Oxus, which for a considerable distance divides it from Amu-Daria (formerly a part of the khanate, but now Russian territory), and at its N. extremity by the Sea of Aral. In the oases which are mostly situated near the Oxus, and irrigated by means of canals connecting them with the river, rice and other cereals, fruit and vegetables, grow abundantly. Of the numerous nomad races inhabiting Khiva, the most important is that of the Uzbeks, to which the family of the Khan belongs. The capital **KHIVA**, situated in the largest of the oases, is oblong in shape, and surrounded by a double wall. With the exception of three mosques, a school, and a caravanserai, the houses are constructed of mud. The designs of Russia against Khiva culminated in 1873, when the district of Amu-Daria was annexed, and the remainder of the khanate was placed under Russian suzerainty.

Khmer. [CAMBOJANS.]

Khmu, a wild tribe of North Siam, in the hilly district between Vien-Shan and Luang Prabang. They are the Kamu and Kamet of MacLeod, and appear to be a remnant of a large nation including the Khas, Mis, Does, and Lemets, whose domain was invaded and broken into fragments by the Laotians at some remote epoch. All these speak a language offering merely dialectic differences, but quite distinct from that of the Laotians and Siamese.

Khoi, a Persian town, in the province of Azerbaijan, 75 miles N.W. of Tabriz, on the road to Erzeroum.

Khojars, a branch of the Mohmand Afghans, who occupy the northern slopes of the hills along the left bank of the Kunar river, Kunar district; eight divisions, besides those on the southern slopes of the same mountains, who are not subject to the ruler of Kunar. (MacGregor, *Afghanistan*.)

Khojend, a town of Russian Turkestan, on the Sir-Daria, in the government of Ferghana, 75 miles S. by W. of Khokand. It is surrounded by a wall and fosse. Khojend was seized by the Russians in 1865.

Khokand, the capital of the ancient khanate of the same name, lies in the Ferghana valley, 10 miles S. of the river Sir-Daria. There are mosques, bazaars, schools, and other public buildings, and a large trade is carried on in cotton and grain, grown in the neighbourhood. The immediate vicinity of the city—where the soil, originally sterile, has become fertile through irrigation—is occupied chiefly by fruit-gardens. Since its annexation to Russia, the khanate has formed the government of Ferghana.

Khonds, aborigines of East Central India, chiefly in the Orissa Hills, with two groups (Kochriah and Paharia) in Sambalpur, are now of Dravidian speech like the Gonds, to whom they seem closely akin. Both terms simply mean "Hillmen" in Telugu. Three chief branches: *Bettiah*, servile tribes in the forests below the Ghats; *Benniah*, free and settled tribes on the wooded skirts of the hills; and the independent *Khonds* of the central tableland of the Ghats; average height, muscular frame, high cheek-bones, nose broad at tip and sometimes arched, full lips; clear glossy skin, ranging from a light bamboo to a deep copper shade; intelligent, pleasing expression; spirit worshippers. (Captain Macpherson in *Calcutta Review*, v. p. 41.)

Khorassan, the largest province of Persia, now lies between 34° and 38° N. lat., and 53° and 61° E. long., and has an area of about 210,000 square miles. It is bounded by Turkestan on the N., Afghanistan on the E., the province of Irak-Ajemi on the E., and those of Faristan and Kerman on the S. A large part of the surface is occupied by a vast salt desert, and elsewhere sandy plains abound, but the mountain ridges on the N. side, in the districts of Meshed and Astrabad, are cloven by many fertile valleys, in which grain, cotton, rice, hemp, tobacco, and other products are grown. There are mines of gold, silver, turquoises and other precious stones, and salt. The principal towns are Meshed and Nishapur.

Khostwals, a branch of the Afghan nation Upper Khost Valley, north-west frontier India, appear to be originally of Mongol stock like the neighbouring Banuchis and Dawaris; ten divisions, with collective population 12,000.

Khotan, a district and city of Eastern Turkestan, situated on the N. side of the Kuen-Lun Mountains. The chief articles of trade are the jade ware and silk stuffs manufactured in the district.

Khrumirs (KRUMIRS), a mixed Arabo-Berber people of the Tabarka Hills stretching inland from the sea between Algeria and Tunis, have acquired a historical reputation from the fact that their (alleged) predatory expeditions served as a pretext for the French occupation of Tunisia in 1881-82. They form a confederacy of one Berber (*Tademaka*) and three Arab tribes (*Selul*, *Meselma*, and *Shiaya*), capable of mustering altogether about 14,000 fighting men armed with muskets. The Khrumirs are a poor, degraded people, living in wretched hovels of branches and mud, the chiefs alone having stone houses, which, however, they share with all the animals of the farmyard. Some came traditionally from the West (Morocco), and claim descent from the renowned marabout (saint) Sidi Ali-bu-Jemel. (Duveyrier.)

Khurja, an important commercial town in the North-West Provinces of India, 50 miles S.E. of Delhi, exports raw cotton to Cawnpur and Calcutta.

Khuzistan, a province of West Persia, bounded on the S. by the Persian Gulf, area 29,325 square miles. The surface is hilly towards the N.E., but

the S.W. portion of the province consists of one vast plain. Cattle-rearing is the most important industry. Shuster and Dizful are the principal towns.

Khyber Pass, the chief opening in the Khyber Mountains, begins 10 miles W. of Peshawur, and extends 33 miles N.W. to the plain of Jelalabad. It is the only route between the Punjab and Afghanistan available for an army with baggage and artillery, and has afforded ingress or egress to numerous invaders from the time of Alexander the Great. The precipices on either side rise in some places to a height of over 3,000 feet. It was here that a British army was in 1842 almost annihilated by the Afghans whilst retreating from Cabul. By the Treaty of Gandamak (1879) the British authorities in India now exercise control over the pass.

Khyengs (KAYENS), aborigines of the Arakan-Yoma Mountains between Burma and Arakan, chiefly on the southern slopes east of the Khamis; are a northern branch of the Karens [KARENS] at a much lower stage of culture than the surrounding Burmese populations. Matriarchal customs still prevail, and till recently the young girls were tattooed all over the face in such a way as entirely to destroy the features. This was said to be done in order to protect them from the neighbouring tribes, by whom they were constantly waylaid in the forests and carried into captivity. The Kayens speak a distinct Karen dialect, and the tribal name itself appears to be merely the Burmese pronunciation of Karen; total population about 55,500.

Kiachta, or KIAKHTA, a Russian town on the Chinese frontier, in the province of Transbaikalia, 165 miles S.E. of Irkutsk. The Chinese town of Maimatchin is in the immediate neighbourhood. From the Treaty of Nertchinsk in 1689 to that of Peking in 1860, by which Russian vessels were admitted to Chinese ports, Kiachta was the chief centre for the exchange of Russian and Chinese goods. The former are chiefly manufactured goods and furs, the latter silks, nankeens, porcelain, and, above all, tea.

Kiao-chow, a town in the province of Shantung, N. China, formally ceded to Germany in January, 1898. The cession of this town was followed by that of Port Arthur to Russia, and of Wei-hai-wei to Great Britain; by many it was regarded as the first step towards the disintegration of the Chinese Empire.

Kickapoos, North American Indians of Algonquian stock, former allies of the Foxes, with whom they camped on the left bank of the Mississippi, between 40° to 45° N. lat. Later these were joined by the Utgamis, and in 1819 they voluntarily removed from the present state of Illinois to Kansas. In 1905 there were 437 in the United States (247, Oklahoma; 185, Kansas) and about 200 in Mexico.

Kidd, WILLIAM, a noted pirate, was born about 1658 at Greenock, and, after having acquired con-

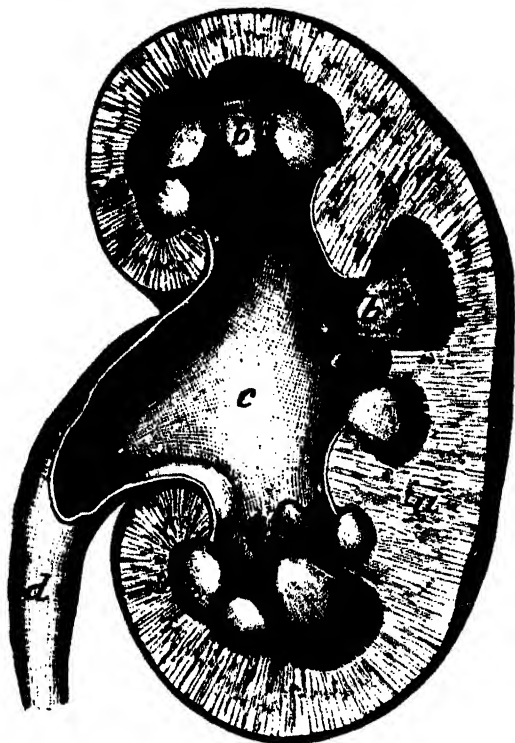
siderable experience in the East Indies, was pitched upon by a committee of noblemen and others to command an expedition, in the *Adventure* galley, against the pirates in those seas, with a commission under the Great Seal. Instead of doing his business, Kidd himself turned pirate, and went to the West Indies, where he committed many depredations. He was at last secured by the Earl of Bellamont, Governor of New England, one of his original employers, and was sent to England, where, after trial at the Old Bailey, he was, with several of his accomplices, executed and hung in chains on the banks of the Thames in 1701. What he did with his immense spoils has never yet been satisfactorily explained; but the popular belief is that he buried them, and that they still lie concealed.

Kidderminster, a market-town and municipal and parliamentary borough on the Stour, in Worcestershire, 14 miles N. of Worcester by railway. It is noted for its manufacture of Brussels and other carpets, established in 1735. The free grammar-school was founded in 1637. There are statues of Richard Baxter, vicar from 1641 to 1660, and Sir Rowland Hill, born here in 1795. Kidderminster was incorporated under Charles I., and has returned one member to Parliament since 1832. Pop. (1901), 24,692.

Kidnapping. The forcible taking away of a man, woman, or child from their own country and conveying them into another. It was a capital crime by the Jewish and civil laws, and is punishable under the English common law. Abduction or detention of children is punished by penal servitude under 24 and 25 Vict. c. 100.

Kidney. The human kidneys, two in number, lie at the back of the abdomen, behind the peritoneal sac on either side of the spinal column, at the junction of the dorsal and lumbar vertebræ. Each kidney weighs a little less than 5 oz. There is an outer investing capsule, which envelops the gland and becomes continuous at the inner concave margin or *hilum* of the kidney with the outer coats of the vessels which enter the gland at that point. These vessels consist of the renal artery and vein and the ureter; down the last-named tube the urine secreted by the kidney passes on its way to the bladder. If the ureter be traced upwards, it will be found to expand on reaching the inner margin of the kidney into what is known as the *pelvis*. The pelvis divides into a number of little cups called *calyces*, each of which receives the pointed extremity of one or more pyramids of the kidney. If a longitudinal section be made through a kidney, it will be found to consist of an outer or *cortical* portion and an inner, which is called the pyramidal portion, being made up of some dozen little pyramids the apices of which abut as aforesaid upon the several calyces into which the pelvis subdivides. The kidney substance comprises the ramifications of innumerable minute tubules. These tubules commence by a blind extremity in the cortex of the kidney, pursue a tortuous course through the cortex, and then a straight course through the pyramids, which latter derive their striated appearance from being composed of bundles

of tubules. As the tubules approach the apex of each pyramid they open into a series of ducts known as collecting tubules, which empty themselves into the calyces. The tubules of the kidneys are lined throughout by a single layer of epithelial cells. These cells secrete from the blood a fluid,



LONGITUDINAL SECTION OF KIDNEY.

a, cortical portion ; b, pyramidal portion ; c, pelvis ; d, ureter.

the urine, which passes along the course of the tubules, finds its way into the calyces, and so into the pelvis of the kidney, and thence down the ureter into the bladder.

The character of the epithelial cells lining the tubules varies in different parts. It will suffice to direct attention, first, to the blind extremity of the tubule in the cortex, and, secondly, to those portions of the tubules which, from the wavy course they pursue through the substance of the kidney, are known as the *convoluted portions* of the tubules. At its extremity in the cortex each tubule expands, forming a kind of cap, which envelops a loop of capillary blood-vessels, forming what is known as a *glomerulus* or *Malpighian corpuscle*. These latter bodies may be seen with the naked eye as minute red points dotted over the cortex of the kidney. The little cap which envelops the loop of blood-vessels is lined with flattened epithelial cells, and certain fluid constituents of the blood find their way from the capillaries through the layer of epithelium, and reach the interior of the urinary tubule. In this manner it is supposed that the bulk of the water of the urine is abstracted from the blood. To pass now to those parts of the urinary tubules which are convoluted, here the epithelium is of the kind known as secreting epithelium, and, the convoluted tubule being surrounded by a close network of capillary blood-vessels, this secreting epithelium extracts from the blood certain of its constituents.

It is supposed that the more important constituents of the urine are secreted and passed into the system of tubules by the epithelium of these convoluted tubules.

It remains to say something concerning the peculiar arrangement of the blood-vessels of the kidney. The renal artery breaks up into a number of branches, many of which find their way towards the cortex of the kidney, and ultimately break up into a series of minute arterioles, each of which finally enters a Malpighian corpuscle. There the arteriole breaks up into the little cluster of capillaries which have been already alluded to as being invested by the blind extremity of a urinary tubule. The blood from these capillaries is collected again into a little vein which emerges from the Malpighian corpuscle at the point where the little arteriole entered it. This little vein, however, breaks up again into a second system of capillaries, which ramify around the convoluted portion of one of the urinary tubules ; the blood from this second system of capillaries is again collected into a little vein, which unites with other veins and finally empties itself into the renal vein, which passes out at the hilum of the kidney. It will thus be noted that there is a double system of capillaries in the case of the kidneys, one set of capillaries being found in the Malpighian corpuscle and another set investing the convoluted portions of the tubules. For diseases of the kidneys, see BRIGHT'S DISEASE.

Hæmaturia.—A stone or calculus is sometimes formed in the kidney, a serious condition which usually calls for operative treatment.

Surgical kidney is the term applied to the condition sometimes met with as the result of backward pressure caused by obstruction to the flow of urine through the urethra or bladder. The kidney may be affected by tubercular or malignant disease.

Kidney Bean. [FRENCH BEAN.]

Kidney Ore, a hard variety of *hæmatite* (q.v.), which is so named from the peculiar reniform shape of the ore masses, and which occurs largely in the Lancashire and Cumberland mineral deposits.

Kieff, a government of South-West Russia, bounded on the east by the Dnieper, and including a large part of the Ukraine, with an area of 19,685 square miles. The surface is flat, and towards the north covered with woods. Large crops of excellent wheat are raised, and the manufacture of beetroot sugar is carried on very extensively. The capital, KIEFF, picturesquely situated on the right bank of the Dnieper, 350 feet above the river, is one of the most ancient cities in Russia. It was the capital of the whole country from 882 to 1169, and the place where Christianity was introduced into Russia in 988. Kieff is now the seat of one of the four metropolitans, and is regarded as an especially sacred spot. Besides the Petchersk Monastery, with its subterranean tombs of saints and martyrs, which are visited by a vast number of pilgrims, and the two cathedrals of St. Sophia (1037) and the Assumption, it contains upwards of sixty churches, whose gilded domes and minarets

give the city, when viewed from a distance, a very brilliant aspect. The university was transferred to Kieff from Vilna in 1833. The Dnieper is here crossed by a magnificent suspension bridge, constructed in 1851. The city really consists of three contiguous but distinct towns—Kieff, Petchersk, and Podol—each of which has its own system of fortifications. The manufactures are unimportant, but there is a thriving trade, which has increased with the progress of Odessa.

Kiel, the chief naval port of Germany, lies at the head of Kiel Fiord, Holstein. It is the Baltic headquarters of the German navy, and possesses a naval academy and a university founded in 1665. The population is about 85,000. Both sides of the bay, in which there is spacious anchorage, are heavily fortified below the town, especially by the works of Priess, Falkenstein, Friedrichsort, Roepsdorf, Stosch, Jagerberg, Korügen, Heidberg, and Möltenort, and the place is almost impregnable. Opposite the town lies Gaarden, where there are extensive private shipbuilding yards. The Government yard is below the town of Gaarden, on the east bank. The Kiel Canal (opened in 1896) connects the Baltic with the North Sea.

Kiepert, HEINRICH (b. 1818), geographer, born at Berlin, studied under Ritter. He was appointed director of the Geographical Institute at Weimar in 1845, and professor of geography at Berlin in 1859. Among his most important atlases are those of *Greece* (1840–46), *Palestine* (1846), and the well-known *Historico-Geographical Atlas of the Ancient World* (1848).

Kierkegaard, SÖREN AABY (1813–55), a Danish author, born at Copenhagen, wrote *Either-Or* (1843), *Stadia on Life's Way* (1845), and other philosophical inquiries into the principles of Christianity.

Kieselguhr is an earthy deposit consisting almost entirely of the siliceous remains of microscopic organisms—*diatoms* (q.v.). It occurs largely in white and grey deposits near Hamburg, and before being applied to its various uses is calcined in kilns built for the purpose. It is largely used as a polishing powder, in the manufacture of ultramarine and firebricks, while large quantities are employed for the manufacture of dynamite. [NITROGLYCERINE.]

Kieserite, hydrous magnesium sulphate ($\text{MgSO}_4 + 2\text{H}_2\text{O}$), is one of the minerals of which beds occur, associated with common salt, at Stassfurt (q.v.) in Saxony. It contains 29 per cent. of magnesia, 58 per cent. of sulphuric acid, and 13 per cent. of water. It crystallises in the prismatic system, but is generally massive. It is translucent and greyish-white, and its specific gravity is 2.52.

Kildare, an inland county of Ireland, in the province of Leinster, bounded by Co. Meath on the N., Dublin and Wicklow on the E., King's County and Queen's County on the W., and Carlow on the S.; area, 654 square miles. The surface is generally level, and the soil a productive clayey loam. The prevailing flatness is broken on the E.

border by offsets of the Dublin and Wicklow Hills, from 1,000 to 1,200 feet in height, and to the W. and N. of the town of Kildare by the Dunmurry and Red Hills and the Hill of Allen (676 feet), which rises abruptly from the Bog of Allen, a tract comprising about one-fifth of the entire county. The Boyne skirts the N.W., the Barrow the S.W. border, and the Liffey enters the county from Wicklow, afterwards curving in a N.E. direction. Kildare is intersected by the Great Southern and Western Railway and the Grand Canal. Agriculture is the chief industry. Woollen goods and paper are manufactured to some extent. Rathes, round towers, and other antiquities abound. Pop. (1901), 63,469.

Kildare, a town of Co. Kildare, 30 miles S.W. of Dublin. The original bishopric is said to have been instituted in the time of St. Bridget, who founded a monastery and nunnery here in the 6th century. The Protestant see is now merged in that of Dublin, whilst Kildare and Leighlin together form a single Roman Catholic diocese. "St. Bridget's Fire," after being kept alight for several centuries without intermission, was finally extinguished in the reign of Henry VIII. A portion of the abbey church or cathedral has recently been restored. In the churchyard there is a fine round tower (103 feet), with a modern superstructure, consisting of an embattled parapet.

Kilimanjaro, a mountain of East Africa, about 20,000 feet in height, situated in $3^\circ 20'$ S. lat. and $37^\circ 50'$ E. long., between Lake Victoria Nyanza and the sea. First ascended in 1869 by the Rev. C. New.

Kilkenny, an inland county of Ireland, in the province of Leinster, bounded by Queen's County on the N., Carlow and Wexford on the E., Tipperary on the W., and Waterford on the S.; area, 796 square miles. The northern part of the county consists for the most part of wide tracts of moor or grassy uplands, used as pasturage for sheep and cattle; the centre is a large plain, broken by hillocks and swelling ground; whilst in the S. the surface becomes more hilly, reaching in many places an elevation of 1,000 or 1,500 feet above the sea-level. The climate is mild and favourable to agriculture, the most fertile districts being along the valleys of the Barrow and Suir, on the E. and S. borders respectively, and that of the Nore, which runs through from N.W. to S.E., where it joins the Barrow. The Castlecomer coalfield in the N. furnishes more than one-half the total amount of coal produced in Ireland. Black marble, slate, manganese, and other minerals are also found. Of the numerous antiquities the most noteworthy is the Castle of Graney, in the barony of Iverk, said to have been built by the Earls of Ormonde early in the 16th century. Pop. (1901), 78,821.

Kilkenny ("Church of St. Canice"), the capital of Co. Kilkenny, is a parliamentary borough, on the Nore, 81 miles S.W. of Dublin by railway. St. Canice's Cathedral is an Early English building, the oldest part of which, the choir, dates from the close of the 12th century. Near the south transept there is a round tower, 100 feet in height. The

most noticeable feature of the interior is the beautiful groined vault under the central tower. There are also remains of several 13th-century abbeys. The Roman Catholic church is a fine building, consecrated in 1857. The castle, which stands on a rocky summit overlooking the Nore, was originally built by Strongbow, and rebuilt by his son-in-law, William Marshal, Earl of Pembroke, at the close of the 12th century. Three round towers and two walls belonging to the original structure remain. The castle was eventually purchased by the Butlers, and now belongs to the Marquis of Ormonde. At the Grammar School Swift, Congreve, and Berkeley were educated. In a Parliament held in this town in 1367 the Statute of Kilkenny was passed, forbidding intermarriage between the English and Irish, and placing other restrictions on the intercourse between the two peoples. After forming a centre of disaffection during the rebellion in 1642, the town was besieged and captured by Cromwell (1648-50). A trade in provisions is carried on with Waterford. Pop. (1901), 12,000.

Killarney, LAKES OF, a group of three beautiful lakes situated in a basin at the northern foot of the lofty Kerry Mountains, in Co. Kerry (q.v.), Ireland. The Lower Lake, or Lough Leane, which is furthest to the N., is 5 miles long, with an average breadth of $2\frac{1}{2}$ miles; the Middle or Muckross Lake is 2 miles long by 1 mile broad, and the Upper Lake $2\frac{1}{2}$ miles by $\frac{3}{4}$ mile. The Lower and Middle Lakes are connected with the Upper by the Long Ranges, a winding stream with picturesquely wooded banks, $2\frac{1}{2}$ miles in length. In many places the mountains rise immediately from the shore of the lakes, and are covered with trees down to the water's edge; the islands also, with which the lakes are thickly studded, are richly wooded, and both here and along the margin there is a luxuriant growth of the *arbutus unedo*, an indigenous plant remarkable for its size and beauty, which is peculiar to this district. On the E. side of the Lower Lake is the peninsula called Ross Island, on which is Ross Castle, a quadrangular tower dating from 1500. Near the Middle Lake are the interesting ruins of Muckross Abbey, originally the monastery of Irrelagh, founded for the Franciscans about 1446 by the head of the McCarthy family, and restored in 1626. The little town of Killarney, $1\frac{1}{2}$ miles E. of the Lower Lake, is entirely dependent on the tourists who visit the district; the only object of interest is the Roman Catholic cathedral, designed by Pugin.

Killiecrankie, PASS OF, an approach to the Highlands on the Garry, in the county of Perth, 15 miles N.N.W. of Dunkeld. The plain above the pass was the scene of the victory and death of Claverhouse in 1689.

Killigrew, WILLIAM, THOMAS, and HENRY, three brothers, sons of Sir Robert Killigrew, who suffered much in the cause of Charles I., but were amply recompensed after the Restoration. Both Sir William (1606-95) and Thomas (1612-83), who from his familiarity with Charles II. became known as the "king's jester," were dramatists of note in

their day. Henry's daughter was the "Mistress Anne Killigrew" (1660-85) of Dryden's elegy, "excellent in the two sister arts of poetry and painting."

Kilmainham, a township of Dublin, adjoining the city. The Royal Hospital for disabled soldiers was founded by Charles II. There is a Government prison, in which Mr. Parnell and his colleagues were confined in 1882; the alleged "Kilmainham Treaty," between Mr. Gladstone and Mr. Parnell, was so called because it was said to have been formed during the latter's imprisonment.

Kilmarnock, a parliamentary borough in Ayrshire, on Kilmarnock Water, 24 miles S.S.W. of Glasgow. It is an important centre of the iron trade, and since 1855 has been famous for its annual cheese fair. The manufactures include carpets, calicoes, tweeds, winceys, boots and shoes. The town has many associations with Burns, to whom a monument was erected in the Kay Park in 1879. Pop. (1901), 34,179.

Kilogramme, the mass of one litre of pure water at 4° C.; 1,000 grammes = 2.205 lbs. [GRAMME.]

Kimberley, the capital of Griqualand West (q.v.), Cape Colony, South Africa, 540 miles N.E. of Cape Town by railway, has sprung up since the working of the diamond mines, which began in 1871. Nearly all the mines are now owned by the De Beers Consolidated Company, which has thus gained an almost complete monopoly of the diamond trade of the world. On the outbreak of the war with the South African Republics in 1899, Kimberley was at once invested by the Boers, and withstood a determined siege until February, 1900.

Kimchi, DAVID (c. 1160-1235), a Jewish Rabbi, probably a native of Narbonne, equally famous as a Hebrew grammarian and lexicographer and as a commentator on the Old Testament. His brother MOSES was also a celebrated Biblical scholar.

Kimeridge Clay, named from the village of Kimeridge in the Isle of Purbeck (Dorsetshire), is an important division of the Upper Jurassic (q.v.), giving the name "Kimeridgian" to the series. It is a bluish-grey or sometimes yellow clay, generally shaly, containing beds of bituminous shale, lignite, crystals of selenite, septarian nodules, and, near its base, sandy beds with clay-ironstone. It is of marine origin, and has a maximum thickness apparently of 660 feet, passing conformably downwards into the Corallian, or, as in Bedfordshire, in the Fens, and in the Sub-Wealden boring near Battle, into clays continuous with the Oxford Clay. To these passage-beds the name Ampthill Clay has been given. The Kimeridge Clay is overlaid conformably by the sands and limestones of the Portlandian. The outcrop of the clay extends from Dorset and Somerset, through North Wilts, Oxfordshire, and the Fens, into Norfolk, Lincolnshire, and the Vale of Pickering, forming broad, flat areas of cold, stiff pasture-land. As the oak flourishes on this soil it was named "Oaktree Clay" by William

Smith, as by confusion were other clays. The pyrites in the bituminous beds has sometimes by its decomposition produced spontaneous combustion, as in the so-called "Volcano" in Ringstead Bay, which burnt for some years. The bituminous shales have been distilled for paraffin, and in prehistoric times a lignite, almost as lustrous as jet, was turned into ornaments near Kimeridge, where the wastrel of the lathe is still found and is known as "Kimeridge coal-money," being supposed to have been used as coin. The Kimeridge Clay has been subdivided into an upper and a lower division. The upper or Virgolian group of foreign authors, characterised by the small oyster, *Exogyra virgula*, consists of paper-shales, bituminous shales, cement-stones, and clays, best developed in the south of England. The lower or Astartian, with *Astarte minima* and *Ostrea deltoidea*, better developed in the north, is often sandy with ferruginous "doggers." Other characteristic fossils are *Ammonites biplex* and numerous saurian remains. On the Continent a middle division, or Pterocerian, with *Pteroceras oceani*, is distinguished. The fine-grained limestone, long quarried for lithographic purposes at Solenhofen, near Munich, in which the oldest-known fossil-bird, *Archæopteryx* (q.v.), was found, together with numerous well-preserved saurian, insect, and other remains, belongs to the Kimeridgian.

Kin, Next of. [NEXT OF KIN.]

Kincardineshire, or THE MEARNs, a county on the E. coast of Scotland, bounded by Aberdeenshire on the N. and N.W. and by Forfarshire on the W. and S.W.; area, 383 square miles. The rivers Dee and North Esk flow along the N. and S. borders respectively. The mountainous district, consisting of the Grampians, which traverse the county from E. to W., is covered with forests and moors, but along the coast, and in the "Howe of the Mearns"—a continuation of the valley of Strathmore in the S. part of the county—the soil is extremely fertile. There are woollen and linen manufactures. Stonehaven (q.v.) is the chief town. Pop. (1901), 40,923.

Kindergarten = "children's garden," the German name for a school for young children conducted on Froebel's system, which combines amusement with instruction and aims at keeping children interested and developing their powers of observation and elementary reasoning as well as their memory. The "object lesson" is an offspring of this system.

Kinematics is the study of motion. It does not investigate the cause which produces motion, but simply the space-relations from time to time, of the moving body. The more important motions are (1) uniform motion in a straight line when the speed is the same at every point, and the distance travelled is directly proportional to the time; (2) uniformly accelerated motion when the body starts from rest and increases its speed uniformly, the distance travelled from rest being in this case proportional to the square of the time and to the rate of change of speed; (3) uniform motion in a circle; (4) simple harmonic (q.v.) motion, which is an oscillatory motion about a point, with a varying acceleration that is always proportional to the

distance of the moving body from the centre. The propagation of a state of motion through a medium without actual transit of the particles composing the medium, is said to be produced by *waves*.

Kinematograph. An instrument on the principle of the magic lantern by which pictures of persons and things in motion are projected. To secure a picture a number of instantaneous photographs of the event desired are taken with extreme rapidity on a continuous film; these when developed provide a series of pictures, which are mechanically passed through a limelight projecting apparatus with such speed as to impart a life-like motion to the scene thrown on to the screen. A film will often contain some thousands of minute photographs to give one "living picture," and will be over 500 feet in length. The instrument was first perfected by Edison in 1890, and developed by Lumière, Pathé, and others.

Kinetics, the study of forces that are not in equilibrium. If a body be so small that the energy due to its rotation about any axis through its mass-centre be negligible, the investigation of the force relations on that body is simple. The body is treated as a particle, of no dimensions, though it is, of course, impossible for such a thing to possess finite mass. Forces acting on it are assumed to act at one point, and the condition of their equilibrium is that the force-polygon (q.v.) shall be closed. The resultant motion of the body is rectilinear when the forces are not in equilibrium, and is identical with that produced by a single force represented in magnitude, direction, and sense by the line closing the force-polygon. The body, therefore, is impressed with a uniform and constant change of speed. If the body be not small, the operation of summing up the effects of the impressed forces will not always be so simple. The motion of the mass-centre of the body will be the same as if all the forces were shifted to that point, parallel to their actual positions. If the sum of the moments (q.v.) of the forces about an axis through the mass-centre be zero, there will be no rotation about that axis; if the sum of the moments have a finite value, there will be a rotation about the axis, with an angular acceleration proportional to the sum of the moments. [DYNAMICS.]

Kinetite, a high explosive, consists of nitrobenzole thickened or gelatinised by the addition of collodion cotton, incorporated with finely-ground chlorate of potash and precipitated sulphide of antimony, and exists as an orange-coloured plastic mass. It needs a comparatively high temperature for ignition.

King, the surname of a distinguished Kentish naval family, of which **SIR RICHARD**, first baronet, was born in 1730, distinguished himself as commodore in Hughes's actions in the East Indies, was made a baronet in 1792 and port-admiral at Plymouth in 1794, and died admiral of the Blue in 1806. His son, **SIR RICHARD**, second baronet, born in 1774, was posted in 1794, commanded the *Sirius*, 36, at the capture of the *Waakzaamheid*, 26, *Furie*, 36, and *Dédaigneuse*, 36, and was captain of the

Achille, 74, at Trafalgar. He was commander-in-chief in the East Indies from 1816 to 1820, and died a vice-admiral and commander-in-chief at the Nore in 1834. His second son, SIR GEORGE ST. VINCENT DUCKWORTH-KING, K.C.B., fourth baronet, born in 1809, was captain of the *Leander* and of the *Rodney* during the Russian War, second in command of the Naval Brigade before Sebastopol, and commander-in-chief in China and the East Indies from 1863 to 1867. He succeeded to the baronetcy in 1887, and died an admiral in 1891.

King-Bird (*Tyrannus carolinensis*), a North American insectivorous bird that preys upon bees. The plumage is slaty-ash above, white below, and there is an erectile orange crest. The name is applied with a distinctive epithet to some other species of the genus.

King-Crabs, an order of branchiate Arachnida (q.v.), known as the Xiphosura. They are of great interest, as they are the nearest living representatives of the extinct orders the Trilobita (q.v.) and Eurypterida (q.v.), and their geological affinities have been in the main determined by work upon this group. The body of the Common King-Crab (*Limulus polyphemus*) consists of three main regions. A large rounded shield protects the anterior end of the body (cephalothorax). This is continued back into two sharp angles, between which is a smaller area formed of the rest of the thorax and the abdomen (more correctly, the mesosoma and metasoma) fused together; this region protects the folded plate like gills or branchiæ. The third region consists of a long, straight spine or telson. The appendages around the mouth are very characteristic of this order, as there are six pairs, which all end in claws, while the basal joint (or coxa) of each is modified to act as a jaw. At one time the King-Crabs were placed with the Crustacea, but their true affinities with the Arachnida are now generally recognised. In their development they pass through a stage much like the Trilobite *Trinucleus*, and there can be no doubt that this order and that of the great Eurypterids (q.v.) of the Silurian and Devonian periods must follow the King-Crabs into the Arachnida. The living forms are marine, and inhabit the Indian and Pacific Oceans and the Caribbean seas.

King-Cups. [MARSH MARIGOLD.]

Kingfisher, any species of the family Alcedinidæ, with nineteen genera, containing about 125 species, universally distributed. There are two sub-families. In the typical one the bill is long and powerful, with a ridge on the upper mandible. The legs are weak, but the toes, united for part of their length, are well adapted for perching, and the flight is strong and rapid. The Common Kingfisher (*Alcedo ispida*) is a fairly common British bird, chiefly frequenting the south of England. The total length is about 7 inches, and the plumage chiefly blue and green, with brilliant metallic gloss. It usually dives for its prey from a bough overhanging a stream; and the fish taken not only serves for food—from the disgorged bones is built the nest, which is situated at the end of a hole in the bank. This bird is the halcyon of classic myth, the

widowed Alcyone who shared the transformation of her husband Ceyx (Ovid, *Met.* xi.). The Daceloninæ, the second sub-family, have a stouter and flatter bill, and feed on insects, frogs, mice, etc. The type-genus Dacelo inhabits Australia and New Guinea. The best-known species is *D. gigas* ("the Laughing Jackass"), about the size of a crow, with chestnut plumage, barred with light blue on the wings. Its note is a wild, unearthly laugh.

Kinglake, ALEXANDER WILLIAM (1809–91), historian, was born at Taunton, and educated at Eton and Trinity College, Cambridge. He was called to the bar in 1837, and represented Bridgewater as a Liberal from 1857 to 1868. In 1844 he published a graphic and picturesque volume of travels entitled *Etthen*. His *History of the War in the Crimea* (eight volumes, 1863–87), one of the most brilliant historical works in the English language, was based on the most careful inquiry into details as well as on his personal observations; but many critics regard it as coloured by an overgreat admiration of his friend, Lord Raglan.

Kinglet. [GOLDEN-CRESTED WREN.]

Kings, BOOKS OF, two historical books of the Old Testament, coming after the Books of Samuel, the four being called the Books of the Kingdom. They were probably compiled by several persons, who wrote successively on their own times, and were edited, with additions, by a writer of the 6th century B.C. They deal with the period from the close of David's reign to the death of Nebuchadnezzar during the Captivity.

King's College (LONDON), an educational institution in connection with the Church of England, founded and incorporated in 1828, opened 1831, confirmed in 1882 by Act of Parliament. The subjects taught include theology, literature, science, mechanics, medicine. There are also a female department, evening classes, and a preparatory school for boys. It grants the title of associate.

King's Counsel. [BARRISTER.]

King's County, a county of Ireland in the province of Leinster, bounded by Co. Westmeath on the N., Roscommon on the N.W., Galway on the W., Tipperary on the S.W., Kildare on the E., and Queen's County on the S.; area, 772 square miles. The surface is level, comprising a large portion of the Bog of Allen, besides numerous other bogs; but on the S. border there is a mountainous district, consisting of the western half of the Slieve Bloom range. The soil, chiefly a gravelly loam, is fairly good. The Shannon skirts the N.W. border. The county was formed in 1557, and named after Philip of Spain. Pop. (1901), 60,129.

King's Evil, a popular name applied to scrofula, which was at one time believed to be curable by the touch of the royal hand.

Kingsley, CHARLES (1819–75), novelist, poet, and social reformer, was born at the vicarage of Holme on the edge of Dartmoor. From King's College, London, he proceeded to Magdalene College, Cambridge, and, after graduating with double honours (1842), was ordained, and received

the curacy of Eversley in Hampshire. He was presented to the living in 1844, and remained here throughout the rest of his life. Although, from the circumstances of his birth and education, Kingsley sympathised keenly with the tastes, the pursuits, and even the prejudices of the upper ranks of society—a bias which he retained to the end of his life—he was, nevertheless, an ardent champion of the rights of the working man, whose condition he regarded as a disgrace to a country professing Christianity. As a member of the little group called “Christian Socialists” he advocated the principle of co-operation, and the evils of the “sweating system” were vividly exposed in his first novel, *Alton Locke* (1849). In the same work he displayed his sympathy with the aims and aspirations, if not the methods, of the Chartists, whose cause he had already aided powerfully by his letters in the *Christian Socialist* and *Politics for the People*, signed “Parson Lot.” *Yeast* (1851) showed a keen insight into the condition and the wants of the agricultural labourer. Kingsley also took an active part in promoting sanitary reform, and other measures for improving the material as well as the moral surroundings of the labouring population. He afterwards earned a more brilliant, though not more honourable, reputation by his historical novels *Hypatia* (1853), *Westward Ho!* (1855), and *Hereward the Wake* (1866), dealing respectively with the struggle between the Church and the Neoplatonists at Alexandria in the 5th century, the conflict of England with Spain and of the Protestant with the Roman Catholic religion in the reign of Elizabeth, and the last efforts of the conquered Saxons against William the Norman. Kingsley was Professor of History at Cambridge from 1860 to 1869, when he was appointed a Canon of Chester. As a Churchman he must be classed with the “Broad church” section, but with him religion was a matter of intense personal conviction, and he carried into his own all the earnestness and vigour which were inseparable from his character. His drama, *The Saint's Tragedy* (1848), never attained wide popularity, but his beautiful lyrics, *The Sands of Dee* and *The Three Fishers*, have earned him a recognised place among the poets of the 19th century. His brother, HENRY KINGSLEY (1830–76), wrote many novels, at once stirring and pathetic, of which *Ravenshoe* (1861) is perhaps the best.

Kingston, WILLIAM HENRY GILES (1814–80), a popular writer of tales of adventure for boys, generally dealing with life at sea and in remote parts of the world. Among the chief favourites must be reckoned *The Three Midshipmen*, *The Three Lieutenants*, *The Three Commanders*, and *The Three Admirals*.

Kingston, a city of Canada in the province of Ontario and co. of Frontenac, on the N.E. coast of Lake Ontario, 160 miles E.N.E. of Toronto. It stands on the site of the old French fort of Frontenac, near the mouth of the Cataragui, which forms a fine harbour as it enters the lake. The town, which is well fortified, contains many handsome buildings, and carries on a brisk trade. The

industries include shipbuilding, locomotive, and general engineering.

Kingston, the capital of Jamaica, and an important commercial town, is situated on the S. coast of the island, on a sloping plain which rises from the sea to the Blue Ridge Mountains on the N. A spur of these mountains encloses the city on the E., and afterwards becomes a promontory extending 6 miles westwards, so as to form one of the most magnificent harbours in the world. At its extremity is the town of Port Royal. A railway connecting Kingston with Spanish Town, the old capital, 10 miles to the W., was constructed in 1846. Kingston was almost destroyed by fire in 1882, and in 1907 there was a disastrous earthquake.

Kingston, a city of the U.S.A., capital of Ulster County, New York State, on the Rondout, 54 miles S. of Albany. It exports large quantities of flagstones.

Kingston-upon-Hull. [HULL.]

Kingston - upon - Thames, a municipal borough and market-town of Surrey, on the right bank of the Thames, 5 miles S. of Richmond, and 12 miles S.W. of London by railway. The residents are for the most part London business men. A bridge or ford existed here at a very early date, and many Roman antiquities have been found in the neighbourhood. The King's Stone, a rude block on which seven of the Saxon kings are said to have been crowned, now stands in an open space in front of the Court House. Kingston received its first charter from King John. Pop. (1901), 34,375.

Kingstown, a thriving seaport, 7 miles S.S.E. of Dublin. Prior to 1817 it was an insignificant fishing village. Its harbour, begun in that year from designs by Rennie, was completed in 1859, at a cost of £825,000. It has an area of 250 acres, and is described by the Tidal Harbour Commissioners as “one of the most splendid artificial ports in the kingdom.” The name was changed from Dunleary to Kingstown on the occasion of a visit of George IV. in 1821. It is now a fashionable suburb of Dublin. Mail-packets cross to and from Holyhead twice daily.

Kinkajou (*Cercoleptes caudivolvulus*), an arboreal arctoid carnivore, from Central America. The body, about a foot long, with a tail half as much more, is covered with soft yellowish-brown fur. It is lemur-like in appearance, uses its hands, feet, and prehensile tail quite in monkey fashion, and feeds on fruit and small animals.

Kinkel, JOHANN GOTTFRIED (1815–82), a German poet, born near Bonn, wrote *Otto der Schütz* (1846), and other epics, *Nimrod*, a drama (1857) and numerous other works.

Kino. There are two preparations of this drug in the pharmacopœia—tincture and compound kino powder. Kino is used for its astringent properties and is a valuable remedy in some forms of diarrhoea.

Kinross-shire, a county of Scotland, bounded by Perthshire on the N. and W., and by Fifeshire on the E. and S.; area, 78 square miles. It consists of a level plain surrounded by hills, ranging from

734 to 1,573 feet in height. Pop. (1901), 6,980. On the W. side of Loch Leven, which occupies the centre of the plain, and 27 miles N.N.W. of Edinburgh, stands the capital, Kinross, an ancient town, containing Kinross House (1685), designed by Sir William Bruce, the architect of Holyrood.

Kinsale, a municipal borough, seaport, and important fishing station in Co. Cork, 24 miles S.S.W. of Cork by railway. The town, which is quaint and picturesque, is situated on the slope of Compass Hill, overlooking the winding estuary of the Bandon, which forms a fine natural harbour. The antiquities include a 14th-century church and a ruined castle of the De Courcys, some two centuries older. A part of the town, called the "World's End," is still inhabited by the descendants of the Spaniards who landed here in support of the O'Neill confederacy, and held the town for ten months against Lord Mountjoy and Sir George Carew (1601-2). James II. landed (1689) and re-embarked (1690) here.

Kintyre, or CANTYRE, (Gaelic, "headland"), a peninsula in the S. of Argyleshire, running 42 miles S. by W. between the Firth of Clyde and the Atlantic, with a mean breadth of 7 miles. A low ridge of hills traverses the peninsula from N. to S. In the N. it is connected with Knapdale by the isthmus of Tarbert, and terminates in the S. in the Mull of Kintyre, 13 miles distant from Ireland, with a lighthouse 297 feet above high water.

Kipchaks, a historical Turki nation, Eastern Turkestan, now chiefly between the Kara-daria and Naryn rivers, province of Andijan. Although often classed with the Buruts, their affinities seem to be rather with the Kirghiz. Some even regard them merely as a branch of the Middle Horde, by whom the purity of the Kirghiz type and speech has been best preserved. After the overthrow of the ancient Kipchak kingdom about the Lower Volga, the nation was dispersed in various directions, so that groups of Kipchaks are still found in Bokhara, Khiva, Khokand, and many other places.

Kipling, RUDYARD (b. Bombay, 1865), educated in England, in 1882 went out to India. His best-known works are *Soldiers Three*, *Plain Tales from the Hills*, *Life's Handicap*, *Barrack-room Ballads*, *The Jungle Books*, *Stalky & Co.*, *From Sea to Sea*, *Kim*, *Just-so Stories*, *The Five Nations*, *Traffics and Discoveries*, and more recently *Puck of Pook's Hill* (1906), and *Actions and Reactions* (1909).

Kirby, WILLIAM (1759-1850), the entomologist, was educated at Ipswich and Cambridge. He took orders in 1782, and became vicar of Barham, Suffolk, in 1796. Before becoming an entomologist he gave much attention to botany, and was one of the original fellows of the Linnæan Society. In 1802 he published a monograph on English bees. Three years later he made the acquaintance of William Spence, and in 1815 appeared the first volume of their joint work on entomology. Kirby, who was elected F.R.S. in 1818, was also author of *The History, Habits, and Instincts of Animals*, and founded the new insect order of Strepsiptera. [SPENCE.]

Kirghiz, a main division of the Tatar race, who occupy a vast domain in South-West Siberia, Turkestan, and East Russia; but their real home are the steppes stretching from the Ural River eastwards to beyond Lake Balkash (50°-85° E. long.). Three great historical branches—*The Little Horde*, between the Ural River and the Kara-Kum desert, north of the Aral Sea; *The Middle Horde*, from the Aral Sea to Lake Balkash; *The Great Horde*, from west end of Lake Balkash eastwards, besides the *Kara* ("Black") Kirghiz of the Turkestan highlands and those of the Volga steppes, with total population of about 3,000,000. Nearly all are Sunnite Mohammedans and nomads, speaking a Turki dialect closely related to that of Kashgar. Type: medium height, square, flat features, prominent cheek-bones, small, oblique eyes, large mouth, hands and feet very small, yellowish-brown or swarthy complexion; morally frank, honest, and trustworthy, hospitable to strangers, and tolerant in religion, allowing their women to go unveiled, and otherwise indifferent observers of the Koranic precepts. According to national usage, the term *Kirghiz*, of doubtful origin, is restricted to the Kara-Kirghiz, all the others calling themselves *Kazak* ("Riders"), which is the same word as the Russian *Cossack*; hence the Russian compound word *Kirghiz-Kazak* applied to the whole nation. Some writers regard the Kirghiz, not as a distinct race, but as a confederation of numerous nomad Mongolo-Tatar tribes stretching from the Gobi Desert to the Volga, and united together for administrative purposes by Jenghiz Khan and his successors.

Kirkcaldy, a seaport town on the Firth of Forth in Fife, Scotland, 15 miles N. of Edinburgh. It was made a burgh of regality, holding of Dunfermline Abbey in 1334, and became a royal burgh in 1450. It is celebrated for its manufacture of linen cloth, and there are also potteries, and the growth of its shipping industry has been recently aided by the construction of a new harbour. St. Brycedale Free Church, built in 1881, is a fine building, and the town has two public libraries. With three other towns Kirkcaldy unites to form a district which returns a member to Parliament. Pop. (1901), 34,063.

Kirkcudbright, or EAST GALLOWAY, a county or "Stewartry" in the south of Scotland, having Ayr on the N., Dumfries on the E., and Wigtown on the W. Its area amounts to 574,587 acres, and there is a coast-line of 45 miles. It is mountainous in the N.W., but is elsewhere gently undulating. Many cattle are reared, and granite is quarried. There is good salmon fishing at the mouths of the numerous rivers—the Dee, the Urr, the Nith, etc.—and deep-sea fishing in the Solway Firth. Besides the capital, Kirkcudbrightshire contains the towns of New Galloway, Castle Douglas, Gatehouse, and Maxwelltown. The county sends one member to Parliament. Pop. (1901), 39,407. 2. **KIRKCUDBRIGHT**, the capital, stands at the mouth of the Dee at the head of Kirkcudbright Bay. It was made a royal burgh in 1455. The old Court House was built in the 16th century.

Kirkcudbright is a member of the Dumfries district of parliamentary burghs. It has the best harbour in the south of Scotland, but is otherwise without commercial importance. At the mouth of the bay, on Little Ross Island, is a good lighthouse.

Kirke, PERCY (d. 1691), the notorious commander of "Kirke's Lambs," was the son of a courtier of Charles I. and Charles II. In 1666 he was given a commission in the army, and became colonel in 1680. He then went out to Tangier in command of eight companies raised by him in the neighbourhood of London. He became governor of the newly-acquired possession in 1682. On its evacuation two years later he returned to England with his "Lambs" (so called from the Paschal Lamb which was the badge of the regiment). At Sedgemoor he was present as brigadier-general, and after the battle gained his infamous name by his severities, which, however, were much exaggerated. William III. made him a major-general, and in 1690 he reached the rank of lieutenant-general. In 1689 he relieved Derry, and afterwards served at the Boyne and at the siege of Limerick.

Kirkstall Abbey, a Cistercian house (12th century), 3 miles to the N.W. of Leeds, by whose Corporation the ruins were purchased in 1888. The site of the abbey was originally at Barnoldswick. It is long and narrow, in the Perpendicular and Transition Norman styles, and is in a good state of preservation.

Kirkwall, [ORKNEY.]

Kisfaludy, SANDOR (1772-1844), a Hungarian poet, served for many years in the Austrian army, but afterwards devoted himself to literature and farming. His chief work was called *Himfy's Loves* (1801-7). His collected works appeared in 1847, and to these in 1870 were added four volumes of posthumous writings. His brother, KAROLY (1788-1830), who was born at Tet in Raab and died at Pesth, was a prolific dramatist.

Kish. When cast-iron is melted and allowed to solidify, a quantity of graphite—known technically as *kish*—separates out. It is thus also found as deposits in the blast furnaces where iron is smelted.

Kishineff (KISHINEV) the chief town of Bessarabia, a Russian province bordering on Roumania, stands on a tributary of the Dniester. It was ceded to Russia in 1812, and has since then rapidly increased in population. It has some commercial importance, and is an archiepiscopal see. Tobacco, the vine, and various kinds of fruit are grown in the neighbourhood. Kishineff was the scene of violent anti-Semitic disturbances in 1903-5.

Kissingen, a watering-place in Bavaria, situated on the right bank of the Saale, about 18 miles north of Würzburg. It has three mineral springs, besides the spas of Bocklet and Brückenau in the neighbourhood. They have been used for nearly four centuries, but it was not until comparatively recent times that they were much frequented.

Kistvaen. [BARROW.]

Kit-Cat Club, an English club formed about 1700 by thirty-nine noblemen and gentlemen who were favourable to the House of Hanover, said to get its name from one Christopher Katt or Catt, a pastrycook, at whose house it met. The founder was Jacob Tonson, the eminent publisher, and the members included Walpole, Congreve, Addison, and Garth. On the dissolution of the club (1720) every member presented Tonson with his portrait.

Kitchener of Khartoum, LORD, was born in 1850, and entered the Royal Engineers in 1871. From 1883 he was in the Egyptian army, of which he became Sirdar, and in 1898 at Omdurman he completely destroyed the power of the Dervishes. He was made a peer in the same year. In 1899, after the battle of the Tugela, he was appointed Chief of the Staff to Lord Roberts in South Africa, while in 1900, on the return of Lord Roberts, he was made Commander-in-Chief in South Africa. He was largely instrumental in bringing about the Peace of 1902, and, on conclusion of the War, he was granted £50,000 and raised to the rank of a Viscount. From 1902 to 1909 he was Commander-in-Chief of the forces in India.

Kitchen-Midden, a translation of the Danish *Kjökken-mödding*, the name originally given to the pre-historic refuse-heaps containing shells, bones, and implements, and at one time supposed to be raised beaches. Similar heaps occur in Great Britain, France, America, and Australia.

Kite, a popular name for any one of a loosely defined group of birds of the family Falconidæ (q.v.), with weak, untoothed bill, long, pointed wings, and the tail generally long and, in most cases, forked. They are widely distributed, and feed on small vertebrates and offal, and one South American form subsists chiefly on fresh-water molluscs. The type-genus *Milvus*, with six species, ranges over the Old World and Australia. The Common Kite (*M. iclinus*) is about 2 feet long, with brown plumage on the upper surface, where the feathers are edged with red, and rufous below. It is rare in Britain, but in the 16th century was common in the streets of London, and was as useful a scavenger as is *M. govinda*, the Pariah Kite, in Indian cities at the present day.

Kits Cotty House, a fine megalithic structure on the slope of the North Downs near Aylesford, Kent. This dolmen consists of three upright stones, with a cap-stone measuring 11 feet by 8 feet. There is no satisfactory explanation of its name, but it is said traditionally to mark the burial-place of Catigern, who was slain in A.D. 455. All such structures are, however, probably far older.

Kitto, JOHN (1804-54), author of *The Pictorial Bible* and many other works, was born at Plymouth. In 1817 he fell from a ladder and became deaf for life. Two years later he was sent to the workhouse, where he remained for several years, till in 1824 he went to live in Exeter. While there he became interested in religious matters, and in 1827 was sent as a

printer to Malta by the Church Missionary Society. Two years later he went to Persia, and was at Bagdad till 1832. On his return he began his literary career. He published in 1838 *The Pictorial Bible*, and in 1845 *The Lost Senses*. In 1850 he received a Civil List pension.

Kittool Palm (*Caryota urens*), a beautiful tree, 50 to 60 feet high, native to India and Ceylon, with bi- or tri-pinnately divided leaves, 20 feet long and 10 or 12 feet across, with cuneate segments and a sheathing fibrous base. *Toddy* or palm-wine and *jaggery*, or palm-sugar, are prepared from its flower-spikes; sago from the interior of its stem; and *kittool* or *Indian gut*, used for brushes and fishing-lines, from its fibrous leaf-stalks and ramenta.

Kiungtha, *i.e.* "Children of the Rivers," the collective name of the lowlanders of Arakan, called Mugs by the Bengalese; are of Burman stock, and often call themselves Miam-ma, *i.e.* Burmese.

Kizil-Bash, *i.e.* "Red Heads," a term applied to certain Turkoman tribes in Asia Minor and Persia, who form a sect or brotherhood like that of the Beyyadiyahs of Oman; are a fine race, very fair, speaking both Persian and Turki. The name appears to have been originally given by Shah Ismail to the Nikalu, and six other valiant Turki tribes, to whom he owed his successes. Some were settled by Nadir Shah in Cabul, where they are still known as Gholam-i-Shah, the "king's servants."

Kjerulf, HALFDAN (1815-68), Norwegian composer, was born at Christiania, where his father was a government official. He studied law at the university, but on the death of the elder Kjerulf turned to music. He obtained a government grant to enable him to study at Leipzig under Richter, and between 1860 and 1865 set many ballads and lyrics, among which were some of Björnson's and Moore's. His songs were translated by Marzials.

Klagenfurt, the chief town of Carinthia, Austria, dates from the 16th century. Since 1809, when it was taken by the French, it has ceased to be a fortress; but it has an active transit trade and manufactories of white lead, cast-iron, and leather. The chief glories of the place are the palace of the Prince-bishop of Gurk, the Rudolfinum museum, and a large library.

Klamath. [KAROK.]

Klapka, GEORGE, one of the chief leaders in the Hungarian revolution, was born in 1820. He served in the Austrian army till 1848, when he joined his countrymen and rendered distinguished services to Hungary, for whom he held the fortress of Komorn to the last. He availed himself of an amnesty to return to Hungary in 1867. He is the author of *The National War in Hungary and Transylvania* (1851), and some *Memoirs* (1st ser. 1850; 2nd ser. 1886). He died in 1892.

Klaproth, HEINRICH JULIUS VON (1783-1835), traveller and writer on Oriental subjects, was the son of a professor of chemistry at Berlin. Having been sent as interpreter on a Russian embassy to

China, he explored Siberia. After travelling in the Caucasus he returned to Germany in 1812, but spent the rest of his life in Paris, where he was appointed in 1816 professor of Asiatic languages. He published many works in French and German on Oriental philology, Egyptology, etc., and was an accomplished Chinese scholar.

Klausenburg, or KOLOZSVAR, a town in Transylvania, Hungary, about 200 miles S.E. of Buda-Pesth, has a university, a Unitarian college, and other educational institutions. It also contains the national museum. The making of machines and oil are the chief industries.

Kléber, JEAN BAPTISTE (1753-1800), one of the most brilliant generals of the first French Republic, was the son of a Strasburg mason. He first distinguished himself at the siege of Mayence; after which he went to La Vendée, as general of brigade. Although he won the important victories of Mans and Savenay, he was recalled because he dared to be merciful to the conquered. He was soon, however, again employed, and served with distinction under Jourdan in Belgium. He shortly afterwards resigned his command. Having escaped transportation after the 18th Fructidor he went with Bonaparte to Egypt, and was wounded at Alexandria. On the return of the latter to France, Kléber was left in command. Thinking the French cause in Egypt hopeless he concluded the Convention of El Arish, but when this was disavowed by the English government he again took the offensive and defeated the Turks at Heliopolis. Not long after he was assassinated by a fanatic.

Kleene-Bok (*Antelope perpusilla* = *Cephalophus pygmæa*), a very small antelope from South Africa.

Kleist, HEINRICH WILHELM VON (1777-1811), a German dramatist, was born at Frankfort on the Oder. Having left the Prussian army, studied law at Berlin, and travelled, he was advised by Wieland, in 1802, to enter upon a literary career. He still, however, continued his wanderings, and in 1806 was taken prisoner while serving against the French. The next year saw his drama *Amphitryon* published at Dresden; but in the autumn of 1808 he tried to commit suicide. During the French war of 1809 against Austria he wrote some patriotic songs, and in the same year his *Prinz Heinrich von Hamburg* was given at Berlin. Having failed as a journalist, and being unable to obtain a Government post, Kleist put an end to his life in 1811. His best play was *Kätchen von Heilbronn*. He also wrote several stories. He is not to be confounded with Ewald Christian von Kleist, author of *Frühling*.

Klondike, or UPPER YUKON, a river in the N.W. Territories of British N. America. In 1897 gold was discovered on its tributaries, and some very successful strikes were reported. A rush to the district immediately followed.

Klopstock, FRIEDRICH GOTTLIEB (1724-1803), one of the fathers of German literature, was born in Saxony. Having read with deep interest *Paradise Lost*, he devoted his life to the composition of

a German religious epic, which was to be its complement. *The Messiah* was begun while he was a theological student at Leipzig, the first three cantos being published in 1748 in the *Bremische Beiträge*. He was enabled to continue it at his leisure when, in 1751, he was given a pension by Frederick of Denmark. During his twenty years' residence at Copenhagen he finished the great work, which was received with enthusiasm throughout Germany. Chief among his other works was a trilogy on Hermann, the national hero of Germany.

Knapweed, or knobweed (*Centaurea nigra*), a common British composite plant, with globose involucre of many imbricate, blackish-brown, membranous, and fringed scales, forming a hard knoblike head, and a thistle-like inflorescence of crimson tubular florets.

Knaresborough, a town in the West Riding of Yorkshire, 17 miles N.W. of York. There are ruins of a 12th-century castle; and among other objects of interest an old church, a dropping well, and St. Robert's Cave, well known for its connection with the crime of Eugene Aram. The grammar school was founded in 1616. The manufacture of linen and woollen rugs is the chief industry. Pop. (1901), 4,979.

Knee. Three bones enter into the formation of the knee-joint—the femur, the tibia, and the patella or knee-cap. This last-named bone is an example of what is known as a *sesamoid* bone, being an ossified portion of the tendon of the great extensor-muscle, which lies in front of the thigh. The connection of the lower part of the patella with the tibia is called the *ligamentum patellæ*. This ligament is really the extremity of the tendon of the afore-mentioned muscle; the patella being interposed between the ligament and the muscle proper. The knee-joint is one of the largest and most important in the body. It possesses a capsular ligament and numerous other ligaments, the most important of which are what are known as the *crucial ligaments*, two strong bands connecting the femur and tibia, and disposed crosswise. For the diseases to which it is subject see JOINTS, DISEASES OF. The patella, from its exposed situation, is liable to injury; fracture of the patella not infrequently occurs, however, apart from external violence, as the result of muscular action, in cases where a person who is about to fall makes a violent attempt to recover his equilibrium.

Knee-jerk, a sudden jerking of the knee, caused by the contraction of the quadriceps muscle.

Kneller, SIR GODFREY (1646–1723), a painter of German extraction, was a native of Lübeck. He was sent to Leyden with a view to a military career, but afterwards removed to Amsterdam, where he studied painting under Ferdinand Bot, and perhaps had lessons from Rembrandt. After a short residence at Lübeck he went to Italy, where he especially studied the works of Titian and Tintoretto. He now began to paint portraits, and,

after a short stay in Germany, came to England in 1675 with a letter of introduction to Jonathan Banks, a rich merchant. Through him he was introduced to the Duke of Monmouth, whose portrait he painted, and in 1678 was given a sitting by Charles II., whose portrait was being painted by Lely at the same time. His fortune was now made. He painted James II. and Louis XIV., but was, notwithstanding, knighted by William III. Among other sovereigns whose portraits were done by him were Queen Anne, Peter the Great, the Duke of Bavaria, and the Archduke Charles (afterwards Charles VI.). George I. also sat to him, and created him a baronet. Other examples of his work are the *Beauties*, at Hampton Court, the *Admirals*, and the portraits of the Kit-Cat Club.

Knight, CHARLES (1791–1873), an author and publisher, was the son of a Windsor bookseller. He early wrote verses and started a newspaper, but his ambition was to be a popular educator. His first effort in this direction was made in 1820, when he began to edit *The Plain Englishman*. Three years later he set up as a publisher in London, and obtained the assistance of Macaulay, Praed, and other rising men of letters for his magazine. The *Penny Cyclopædia*, *The Gallery of Portraits*, Lane's *Arabian Nights*, the *Pictorial History of England*, and other useful works were published by him. He himself wrote a great part of *London* (1841–44). In 1841 appeared Knight's *Pictorial Shakspeare*. In his *Store of Knowledge for all Readers*, which came out weekly, there were contributions by Harriet Martineau, G. H. Lewes, and Mrs. Jameson. *The Popular History of England*, in eight volumes, was finished in 1862.

Knighthood, the highest rank of chivalry (q.v.), originally the status of a fully-armed and equipped horse-soldier of approved training and valour. The rank and title of knight were thoroughly established before the period of the Norman Conquest, but the institution of knighthood was developed considerably during the period of the Crusades, when the great religious orders of St. John of Jerusalem, the Templars, and the Teutonic Knights were founded, and a religious character impressed to some extent on all knighthood. The noblest persons came to covet a title originally applied to a superior (military) *servant*. In Germany the knight was a *ritter*, a "rider;" in France, Italy, and Spain, a "horseman," *chevalier*, *cavalleri*, *caballeri*. With the decline of chivalry knighthood gradually lost its religious, romantic, and even military characteristics, and degenerated into a lower grade of nobility, though the great national orders maintained their pre-eminence in distinction, some even to the present day. [BATH, GARTER, GOLDEN FLEECE, ST. GEORGE, ST. PATRICK, THISTLE, STAR OF INDIA, ETC.] In Great Britain the knighthood of modern times is a titular reward of distinction, official merit, or political service.

Knights of Labour, a labour organisation founded in Philadelphia in 1869 with the object of

advancing the interests of every kind of labour, skilled and unskilled—in short, of wage-earners generally. Its first large assembly was held in 1878, and it kept increasing until in 1886 its numbers reached 750,000. Since then it has steadily decreased, and now there are only about 100,000 members.

Knot, the nautical name for the geographical mile. It was originally a division of the log-line, answering to half a minute as a mile does to an hour; i.e. it was the $\frac{1}{120}$ th part of a mile. Hence, when a ship was said to be sailing eight knots, it was meant that she was sailing eight miles an hour. The "Admiralty Knot" now means 10 cables, or 6,080 feet (1.1515 statute miles). The following table converts admiralty knots into statute miles of 5,280 feet:—

Knots.	Miles.	Knots.	Miles.	Knots.	Miles.
6.00	6.990	12.00	13.818	18.50	21.303
6.50	7.484	12.50	14.393	19.00	21.878
7.00	8.060	13.00	14.968	19.50	22.454
7.50	8.636	13.50	15.545	20.00	23.030
8.00	9.212	14.00	16.121	20.50	23.606
8.50	9.787	14.50	16.696	21.00	24.181
9.00	10.363	15.00	17.272	21.50	24.757
9.50	10.939	15.50	17.848	22.00	25.333
10.00	11.515	16.00	18.424	22.50	25.909
10.50	12.090	16.50	18.999	23.00	26.484
11.00	12.666	17.00	19.575	23.50	27.060
11.50	13.242	17.50	20.151	24.00	27.636
		18.00	20.727		

Knot (*Tringa canutus*), a northern wading bird of the Snipe family, visiting Britain in the autumn. It is about 10 inches long, with mottled brownish-black plumage above, below brownish-red in summer and white in winter. It is prized as a delicacy, and is said, but without evidence, to be named after King Canute.

Knout, an instrument of torture formerly used in the Russian army, introduced by Ivan III. (1462–1505). It consisted of a whip with a handle 6 inches long and a lash made of leather, fitted with iron rings, of more than 40 inches. Victims frequently died under its application. A knout of milder form is occasionally used now for criminals.

Knowles, SIR CHARLES, BART., English admiral, born in 1702, was with Vernon in the West Indies, and was entrusted with the demolition of the forts at Porto Bello. He assisted at the operations in the river Chagres and at the siege of Cartagena, and in 1743 he commanded the unsuccessful expeditions against La Guaira and Porto Cavallo. He was afterwards governor of Louisbourg, and, upon his promotion in 1747 to flag-rank, was governor of, and commander-in-chief at, Jamaica, upon which station he captured Port Louis, in Hispaniola, and defeated a Spanish squadron off Havana. For some neglect of duty in this action he was court-martialled and reprimanded. In 1757 he was second-in-command of the unfortunate expedition against Rochefort. He became a full admiral in 1758, was created a baronet in 1765, and died in 1777. His son, **SIR CHARLES HENRY KNOWLES, BART.**, also a naval officer, signalised himself during the American War, and, after much hard service,

became a captain in 1780. He had previously distinguished himself by the invention of a valuable code of signals, which remained for many years in use in the navy. In the *Goliath* he was present at the battle of Cape St. Vincent. In 1799 he attained flag-rank, and he died an admiral and G.C.B. in 1831. He wrote much on naval subjects.

Knowles, JAMES SHERIDAN (1784–1862), the dramatist, was born at Cork. His family came to London in 1793, and the boy when twelve years old wrote a ballad, which became popular. Owing to dislike of his stepmother, he enlisted in the militia, and afterwards went to Aberdeen, where he obtained the degree of M.D. and became resident vaccinator. He next took to acting, and at Waterford in 1810 met Edmund Kean. In the same year he wrote a play for the latter, and followed it up by others, but was obliged to make a living by teaching, first at Belfast and afterwards at Glasgow, where he had a school for twelve years. In 1825 Hazlitt described Knowles as the first tragic writer of his time. The writer was, notwithstanding, compelled to supplement his income by acting in his own plays and by lecturing. *The Hunchback* having been accepted by Macready, but not produced for some time, Knowles got back the MS., and the play was given to Charles Kemble at Covent Garden. It came out on April 5, 1832, with Miss Kemble as Julia and Master Walter by the author. *The Love Chase* was produced in 1837. In 1834 Knowles had a successful American tour, and in 1848 was granted a Civil List pension.

Know-Nothings, a name, derived from their affectation of mystery, given to the *Americans*, the members of the Native American Party, an association based on hostility to foreign immigrants and to Roman Catholics, which in 1844 gained some political success in New York and Philadelphia, but after some riotous attacks on Roman Catholics in the latter city soon sank into oblivion. The name was also applied to the party which, in 1889, wrested the municipal government of Boston from Irish control.

Knox, JOHN (1505–72), the great Scotch reformer, was born at Haddington, and educated there and at Glasgow. He took orders as a secular priest about 1530, and it was not till sixteen years later that he became a Protestant. In 1547, when the French took St. Andrews, he was carried off to France as a prisoner, and had to work in the galleys for nearly two years. Early in 1549 he came to England, and remained there throughout the reign of Edward IV. He was at first minister of Berwick but was afterwards appointed one of the king's chaplains. He was also consulted with reference to the Forty-Five Articles of Religion. When Mary came to the throne he had to leave the country, and he remained on the Continent, chiefly at Geneva, till 1559. On his return to Scotland he joined the Lords of the Congregation, and took the chief part in the Scottish Reformation, drawing up the Confession of Faith in 1560. He did not alter his conduct when Mary Stewart became queen, and

after holding several conferences with her, in which he held very plain language towards her, he was in 1562 tried for treason. He was acquitted, but again came into collision with the Court in consequence of some sermons he preached after the Darnley marriage in 1565. He was then inhibited from preaching, but, notwithstanding, preached the sermon when the young James was crowned. On the death of Murray in 1569 he left Edinburgh, where he had officiated for many years, and retired to St. Andrews. In 1572, however, he preached at Edinburgh again, notably on the occasion of the news of the massacre of St. Bartholomew. In the same year he died. He was a great political force in Scotland, but his *Blast of the Trumpet against the Monstrous Regiment of Women*, though directed against her rival, gave mortal offence to Queen Elizabeth, and probably increased her distaste for affording any substantial support to the Scotch Reformation. Knox's *Historie of the Reformation of Religion within the Realm of Scotland* is a very important historical work.

Knur and Spell, an elaborate development of bat, trap, and ball, played on the Yorkshire moors, the trap (*spell*) being carefully made of metal, and the ball being driven by a slender club, the *knur*. The ball is often sent more than 100 yards.

Koala (*Phascolarctos cinereus*), the Native Bear, an arboreal marsupial from Eastern Australia. It is about 2 feet long, with thick ashy-gray fur. The two inner digits on the fore limbs oppose the other three, and the great toe is thumb-like in functions.

Kobold, an earth spirit, a gnome (q.v.).

Koch, a widespread people of North-East India and Assam, now mostly Hinduised, speaking Bengali and Assamese. Two main divisions, *Bania* (*Pani*) and *Tintikya*, with a great many sub-groups, and collective population of 1,590,000, of whom about 10,000 in the Garo Hills still preserve their primitive speech and customs intact. By Dalton they are regarded as a branch of the great Bhuiya family, whom he classes as Dravidians, while others connect them with the aboriginal Negrito element. They often present a decidedly Negroid type, with thick lips, curly beard, marked prognathism, and almost black complexion.

Koch, ROBERT (b. 1843), a distinguished German physician, was born in the Hartz district. Having taken his M.D. degree in 1866 at Göttingen, he was from 1872 to 1879 attached to a medical department at Woolstein. He had already made important discoveries in connection with consumption and cattle disease, when in 1883 he was sent to India by the German Government to inquire into the causes of cholera. The result was the discovery of the bacterium in 1884. In 1885 he became professor of hygiene at Berlin, and in 1892 rendered important services in connection with the cholera epidemic at Hamburg.

Kock, CHARLES PAUL DE (1794-1871), a voluminous and once popular French novelist, was born at Passy, his father being a Dutch banker. He

began to write at seventeen, and in all produced works which fill nearly sixty volumes. Among the best known of them are *André le Savoyard*, *Georgette*, *Le Barbier de Paris*, and *Mœurs Parisiennes*. They are of the coarse realistic type, but show both observation and invention.

Koh-i-noor, "MOUNTAIN OF LIGHT," a large diamond belonging to the British Crown. Indian tradition states it to have been found near Golconda more than 5,000 years ago. Tavernier saw it apparently in the possession of the Great Mogul in 1665, when it weighed 280 carats, but was said to have been unskilfully reduced from a former weight of 793 carats. In 1739 it came into the possession of Nadir Shah, and in 1813 into that of Runjeet Sing. On the annexation of the Punjab in 1849 it became British, but only weighed 186 carats. It has since been recut as a rose-diamond, and so reduced to 106 carats. It is suggested that the Russian Orloff diamond, which weighs 194 carats, and a stone weighing 132 carats, long used by a peasant as a strike-a-light and still belonging to Persia, both originally formed parts of the Koh-i-noor.

Kohl, JOHANN GEORG (1808-78), a German writer and traveller, was born at Bremen, and educated at Göttingen, Heidelberg, and Munich. He travelled in every part of Europe between 1842 and 1851, and wrote works descriptive of his experiences, and afterwards visited Canada and the United States, which he also described. On his return he left Dresden for Bremen, in which latter he was city librarian till his death. His *History of the Discovery of America* was translated into English in 1862.

Kohl-Rabi, or TURNIP-CABBAGE (*Brassica oleracea caulorapa*), is a biennial race of cabbages with the upper part of the stem swollen like a turnip, but produced above ground, green and bearing leaves with wide bases to their stalks. It is very hardy, standing either drought or frost. It is better adapted for strong soils and for dry, hot climates than is the turnip. Cattle and sheep are fond of it.

Koibal. [SOYOTES.]

Kola Nut, the seed of *Cola acuminata*, a sterculiaceous tree, 40 feet high, native to west tropical Africa. In the Western Soudan, where it is known as the *Guru nut*, it is highly valued, being used to clear and sweeten muddy water, to assist digestion, and to allay hunger. About 1865 it was brought into notice as a source of caffeine, of which it contains over 2 per cent., or more than the best coffee, together with glucose and more theobromine and three times as much starch as cacao-beans, which belong to the same natural order. A somewhat bitter chocolate has been prepared from these nuts. About 1,000 baskets of 3 cwts. each are annually imported into Senegambia from Sierra Leone for transmission to France and Germany. The Bitter or Male Kola (*Garcinia Kola*) contains no caffeine.

Kolapur, the name of a tributary state in the presidency of Bombay, having an area of 2,816 square miles; also of its chief town, a place of some size and commercial activity.

Kolarian, a conventional name first applied by Campbell (1866) to numerous hill tribes of Central India, regarded as the true aborigines of the peninsula, distinct in type and speech both from the Dravidians and Aryans; seem to have entered from the north-east, and are probably of Tibeto-Burman stock, intermingled with a still more primitive Negrito element. Many now speak Dravidian and Aryan dialects, but ten distinct Kolarian languages still survive—*Sonthal*, *Munda*, *Kharia*, *Mal-Paharia*, *Juang*, *Gadaba*, *Korwa*, *Kur* (*Kurku*), *Mehto*, and *Savara*. These constitute the so-called Kolarian linguistic family, which was formerly widespread over the plains of Bengal, but is now restricted to the hilly and jungly tracts between Upper and Lower Bengal, to Chota Nagpore, and generally from south of the Ganges to about 18° N. lat. (*Report of the Ethnological Committee of the Central Provinces*, 1868; Caldwell, *Dravidian Grammar*.)

Kolin, a town in Bohemia, situated on the Elbe some 40 miles S.E. of Prague. It is celebrated in history as the scene of one of the great battles of the Seven Years' War, Frederick the Great being defeated here by the Austrians under Daun. The inhabitants are chiefly engaged in the manufacture of sugar and chemicals.

Kölliker, ALBRECHT VON (b. 1817), a Swiss man of science, was born at Zürich, where, after studying in Germany, he became professor of physiology in 1845. Two years later he went to Würzburg as professor of anatomy. He took part with Von Siebold in founding the *Zeitschrift für wissenschaftliche Zoologie*. He has especially devoted himself to the study of embryology, and has written works on *The Development of Man and the Higher Animals*, the *Challenger* report on Pennatulida, and *Handbuch der Gewebelehre des Menschen*, translated for the Sydenham Society as *Handbook of Human Histology*.

Kolomea, or KOLOMYIA, a town in Galicia, Austria, 112 miles S.E. of Lemberg, stands on the Upper Pruth. It has large potteries and petroleum and paraffin candle works. A considerable proportion of the inhabitants are Jews.

Kolomna, a town in the government of Moscow, Russia, stands on the Moskowa about 65 miles S.E. of Moscow. The silk and woollen manufacture is the chief industry, but soap, leather, and machines are also made. It was the scene of a Mongol victory over the Russians in 1237.

Komorn (KOMAROM), a town in Hungary, situated at the junction of the Danube and Raab, 48 miles N.W. of Buda-Pesth, on an island called Gross Schütz, connected with the mainland by a bridge of boats. Since the 13th century it has been one of the strongest fortresses in Europe, and was besieged unsuccessfully by the Turks twice in the 16th and once in the 17th century. The fortifica-

tions were improved early in the 19th, and it held out against the Austrians for eleven months in 1848-49. The town is poor, and its trade unimportant.

Kong, a district of Western Africa lying between Liberia, Ashanti, and the Ivory coast, since 1889 under French protection. The Kong Mountains rise a few hundred feet above an elevated plateau of from 2,000 to 6,000 feet. The town of Kong is 500 miles south of Timbuctoo. Its inhabitants are engaged in the manufacture of cotton stuffs and in indigo dyeing.

König, FRIEDRICH (1774-1833), inventor of the steam-press, was a native of Eisleben, Saxony. Being unable to obtain money in Germany to carry out the scheme he had conceived, he came to England in 1806, and with the help of Thomas Bensley, a London printer, a patent was obtained in 1810, the new invention being first used in printing the *Annual Register* of 1811. Improvements were introduced in the followers, and in 1814 the *Times* was first printed by steam-power. In 1816 König also invented a single-cylinder registering machine. A little later he left England and settled at Oberzell, near Würzburg, where with Bauer he set up a manufactory of steam-presses.

Königsberg, a fortified town in East Prussia, near the mouth of the Pregel, was formerly the residence of the Electors of Brandenburg, and still ranks as the third town of Prussia. Still further back it was the headquarters of the Teutonic Knights. The cathedral, dating from the 14th century, contains the tombs both of the Grand Masters of the Order and of the Dukes of Prussia. It was restored in 1856. Little or nothing of the original 13th-century castle remains, the present building dating in its oldest parts from the 16th century only. The Exchange was built in 1875. The Albertine University, so called from its founder the Margrave Albert, has a large library and a famous observatory. It was rebuilt in the 19th century. Königsberg has large iron-works, and makes machines of all kinds, and pianos. Its chief import is tea, and its largest export corn. At Pillau, 28 miles to the W., the larger merchant vessels unload. In 1365 it became a member of the Hanseatic League, but it was not till 1626 that it was first fortified. It was occupied by the Russians during the Seven Years' War, and was in the hands of the French after Jena. In 1843 it was made a fortress of the first class. The citadel of Friedrichsburg, erected in 1657, is now used as a store.

Königsmark, PHILIP CHRISTOPH GRAF VON. a Swede in the Hanoverian service, who was born about 1660, was accused of intriguing with Sophia Dorothea, wife of the Elector, afterwards George I. of England, and was probably murdered by his orders in 1694.

Konkan, the name given to a coast district in the presidency of Bombay, India, extending from Thana on the N. to the boundary of Goa on the S. The Western Ghats form its eastern boundary. It is well watered. The Marathi dialect is spoken in this district.

Koodoo (*Strepsiceros kudu*), a large African antelope, widely distributed, but becoming rare in the South. The male stands about 13 hands high, and is greyish brown in colour, with white stripes on the sides. The horns are large and spirally twisted. The Lesser Koodoo (*S. imberbis*), from Somaliland and Eastern Africa, is smaller, but similarly marked.

Koran, the name given to the book which contains Mohammed's revelations, used originally for each distinct one, and now for the volume containing them all. According to the Moslem creed, the Koran is a block of stone, resting by the throne of the Almighty, on which is written all the laws, portions of which are supposed to have been told to Mohammed both at Mecca and Medina, either by Gabriel in human shape or by God Himself. Mohammed dictated verses and chapters to a scribe, who wrote on palm-leaves, skins, blade-bones, and the breasts of men, which were thrown carelessly into a box, so that many were lost. After Mohammed's death they were collected into a volume by Zaid Ibn Thâbit, his secretary. In the thirtieth year of the Hegira, Calif Othman had new copies made, placing the 114 suras ("chapters") in descending order as to length. The principal tenets are that there is one God, one true religion, one Day of Judgment. There are said to be more than 20,000 different commentaries on it.

Koranas. [HOTTENTOTS.]

Kordofan, a province of the Egyptian Sudan, lying between Sennaar and Darfur. After being held successively by Sennaar and Darfur, it was annexed to Egypt by Mehemet Ali in 1821. It is called the White Land, perhaps because the White Nile forms its eastern boundary. Most of the population are slaves, the rest being slave-hunters. Kordofan is traversed by no rivers, but water is found a little below the surface of the soil. The breeding of camels and cattle is carried on, while gums, ivory, ostrich feathers, and gold are exported. The chief town is El-Obeid.

Korea. [COREA.]

Koreish, a historical Arab people of the Nejd plateau, which has acquired immense celebrity from the fact that Mohammed was a member of this tribe. The Koreish dialect used by him for the Koran has become the classical language of Arabian literature, and the sacred language of Islam.

Koriaks, aborigines of North-East Siberia between Anadyr Bay and Omolon river, N. of Kamchatka; low stature, thin frames, black lank hair, flat nose, small eyes, round face; fishers, hunters, and in religion Shamanists; language closely related to that of the neighbouring Chukchis, to whom they appear to be akin. The Koriaks are dying out.

Körner, KARL THEODOR (1791-1813), a soldier-poet of Germany, was born at Dresden, his father being the friend of Goethe and Schiller. At the Freiberg School of Mines he composed some lyrics, which were published in 1810. After studying for

a short time at Leipzig and Berlin, he, in 1811, went to Vienna. During the next two years he produced some tragedies (*Rosamunde* and *Zring*) and other plays (*The Watchman*, etc.) and lyrics. Körner joined the students' corps of Black Hussars in the War of Liberation, when he was mortally wounded in a skirmish between Gadebusch and Schwerin. The best of his patriotic songs are contained in *Leyer und Schwert*, an English version of which appeared in 1839. Many lives of Körner have been published, one of which is by his son Jonas (1881). At Dresden there is a Körner Museum.

Kosciuszko, TADEUSZ (1746-1817), the great Polish leader, was born in Lithuania. He was educated in France at the expense of the State, and on his return to Poland entered the army. In 1777 he went to America, and served throughout the War of Independence. In 1786 he returned to Poland, and three years later was made major-general. The first services rendered by the great patriot to his country were in the war with Russia in 1791-92, when he distinguished himself at Dubienka, having heavy odds against him. After the peace he resigned his commission, but in 1794 was recalled and requested to act as commander against the Russians. He defeated them near Cracow, and a rising followed by which the enemy were driven out of Poland. Now, however, Prussia interposed, and Kosciuszko was defeated at Szezekochin. He defended Warsaw successfully for a time, but in an attack on a superior Russian force which came to its relief he was overpowered by numbers, wounded, and made prisoner. After two years' captivity he went to England, and thence to America, but in 1798 finally settled in France. He refused to assist Napoleon in his designs on Poland, and disowned the appeal issued in his name. In 1814 he had an interview with Alexander I. in France, but nothing came of it, and next year Kosciuszko retired to Switzerland, where he died from the results of a horse accident. He was a greater soldier than statesman. The most accessible life is in Michelet's *Pologne et Russie, Légende de Kosciuszko*.

Kossovo, a strip of level country on the south-eastern frontier of Servia, about which there is a body of literature celebrating the two battles fought on it. The first took place on June 15, 1389, and was fatal to Servian independence, though Sultan Murad I. fell in the fight. The second was the victory in October, 1448, which Murad II. won over Hunyadi, the Hungarian leader.

Kossuth, LOUIS, the Hungarian patriot, was born in 1806. In 1832 he began his political career as a proxy in the Pressburg parliament. He soon embroiled himself with the authorities by publishing a manuscript journal in which the debates were reported, and was imprisoned for refusing to discontinue it. In 1841 he began to edit the *Pesth Journal*, and three years later formed a National League, which was really, though not ostensibly, directed against Austria. In 1847 he was elected member for Pesth, and in 1848 moved the establish-

ment of a responsible Hungarian Ministry. This was granted after a deputation had waited upon the emperor, and Kossuth became Finance Minister. All classes were now to pay taxes and to be equal before the civil authority, the franchise was extended, feudal privileges were given up, and the land system reformed. The Austrian Government now, however, took advantage of the Croat insurrection to revoke the grant of constitutional rights, and when the insurgents had been defeated, Kossuth determined to support the Viennese movement which had followed the third French revolution. The Magyars were defeated, but the Hungarians refused to recognise the new Austrian emperor, Francis Joseph. They were at first successful, but dissensions broke out amongst the leaders, and in October, 1849, Kossuth resigned his dictatorship to his rival Görgey, and took refuge in Turkey. Two years later he came to England, and afterwards went to the United States, giving lectures advocating the Hungarian cause. After his return he passed many years in England, but after 1867 lived in retired life at Turin. Kossuth not only refused to accept the settlement of 1867, but even lost his rights as a Hungarian citizen in 1890, as he had neglected to take the steps necessary to secure them which were prescribed by the Act of 1879. Occasionally, however, of late years he used his influence to check division in the Nationalist party in Hungary (e.g. in 1893). He published two series of *Memoirs of my Exile*, and did a good deal of miscellaneous writing while in England. He died in 1894. [GÖRGEY, HUNGARY.]

Kostroma, a Russian government lying between the governments of Yaroslaff on the W. and Viatka on the E. It has an area of 32,693 square miles, and the surface is undulating with hilly tracts on the right bank of the Volga, and flat marshy ground in the E. In the marshy part are many lakes, and there are still extensive forests of large timber. The capital, also Kostroma, is near the junction of the Kostroma with the Volga, and lies on the left bank of the latter river, its suburbs being on the right bank. It is 200 miles E. of Moscow, and is said to have been founded in 1152. Michel Romanoff was crowned here in 1813. There is a good cathedral, and the churches are numerous. Among the industries are cotton and linen factories, dyeing, tanning, and bark-mat making, and much brandy is distilled.

Kotah, a native state of Rajputana, India, having an area of 3,797 square miles, sloping gradually to the N. from the tableland of Malwa, and crossed from S.E. to N.W. by the Mokandarra range of mountains. It is fertile and well-cultivated, but the climate is extremely hot in the dry season, and in the wet season very unwholesome. The principal exports are opium and grain. The capital, Kotah, is a large, irregularly built walled city near the right bank of the Chumbul, and has some fine temples.

Köthen, a German town on the Ziethe, in the duchy of Anhalt, and till 1853 the capital of a principality, 22 miles N. of Halle and 31 S.E. of Magdeburg. It consists of an old town which

contains two palaces, one of them with a museum and library, and suburbs, and the cathedral has some old stained glass. The chief industries are iron-founding and agricultural-machine making, and the working of malt, sugar, lead, and spirits. Hahnemann established here an homoeopathic institution.

Kotzebue, AUGUST FRIEDRICH FERDINAND VON (1761-1819), a German dramatist born at Weimar. He showed much literary precocity, and produced various kinds of writings at an early age. He entered the Russian service, and from 1814-16 was Russian Consul-General at Königsberg. His dramatic pieces, 200 in all, were published in 44 volumes (1827-29), and show much merit and artistic skill. He ridiculed the romantic school, and his leanings were towards absolutism, as is shown by his *Vom Adel* (1792), and these views eventually led to his being killed by a student at Mannheim.

Kotzebue, OTTO VON, the greatest of German navigators, second son of the above, was born at Revel in 1787. He made several voyages round the world, describing them in two works published respectively in 1821 and 1830. In 1816 he discovered the Sound near Behring Strait that bears his name. He died in 1846.

Koumiss, or KUMISS, a drink made from milk, either cow's, goat's, mare's, or ass's, in which slight alcoholic fermentation has taken place. It was first used by the Kalmucks. There are establishments in Russia for treating invalids with genuine koumiss.

Kovno, a Russian government, S. of Courland, bounded by Prussia and Poland, and just touching the Baltic Sea near Memel. It has an area of 23,000 miles, and forms part of the old Lithuanian government of Wilna, and is well watered by the Niemen, Aa, Wendau, and Duna, and has some fine forests. The majority of the population is Lithuanian, but there are many Jews. The capital, Kovno, partly in a valley and partly on the Vilia and the Niemen, which join in the neighbourhood, is an ancient town, one of the centres of Lithuanian commerce, and annexed by Russia in 1795. A railway passes through, and the town is rising in importance. There are no manufactures, and the chief articles of trade are timber, rags, flax, grain, and linseed. A cast-iron pyramid commemorates the French retreat in 1812.

Kra, an isthmus varying in breadth from 44 miles upward, and connecting Siam with the Malay peninsula. A plan has been formed for piercing the isthmus by a canal which would utilise the mouth of the Pakchan, which trends inland 17 miles to the N.E., and would pass through a low ridge of about 7 miles wide and enter the Gulf of Siam, thus shortening considerably the distance from Hong Kong to the Indian ports.

Krakatoa, or, more correctly, KRAKATAO, a volcanic island in the Strait of Sunda, between Sumatra and Java. It was formerly provided with coral banks, which abounded in turtles, and produced much rice and fruits; but in 1883

a volcanic eruption, which began in May and produced its greatest results on the 26-28th of August, almost destroyed the island, producing in place of what it carried away two small islands, which afterwards sank. An immense ocean wave was also created, which caused great devastation in Java and Sumatra and travelled round the world, while the quantity of volcanic dust which was discharged into the atmosphere produced some splendid sunset effects in our own hemisphere, which lasted through the latter part of the year for some considerable time afterwards.

Kraken, a sea-monster said to frequent the Scandinavian seas, where the fishermen often mistook it for an island (*cf.* Milton, *Paradise Lost*, i. 200-208). The first description we find was by Pontoppidan, Bishop of Bergen, in Norway (d. 1764). He made it $1\frac{1}{2}$ miles in circumference; but, like the great sea-serpent, it is not much believed in by scientific men. From his description of the creature seizing and dragging down ships with its enormous arms, the original of the myth would seem to be a gigantic cuttle-fish.

Krause, KARL CHRISTIAN FRIEDRICH (1781-1832), a German eclectic philosopher, was born at Eisenberg, and studied at Jena under Fichte and Schelling, and became a *privat-docent*. From 1805-13 he resided at Dresden and at Göttingen, where he lectured on philosophy 1823-30, going in 1831 to Munich, where he died. He was a contemporary of Cousin. Called by one critic *le philosophe à bascule*, he was one of the most eminent among the school of thought founded by Kant, though his practice of eschewing the technical terms generally in use in favour of native-coined words made much of his work difficult to understand. In 1810 he wrote on Freemasonry, and gave the Masons great offence. His *Ideal of Humanity* (1812) was translated into English, and he wrote on system in Logic, on Ethics, and on the Philosophy of Law and the Principles of Science.

Kreasote. [CREASOTE.]

Kredi (KREJ), a term of contempt applied by the Mohammedans collectively to the pagan Negro peoples of Dar-Zerbit and surrounding districts, South-East Sudan; they have not yet been visited by any European traveller, but are described by Schweinfurth on local reports as the ugliest and most debased of all Negro peoples.

Krefeld, manufacturing town and railway junction of Germany, 12 miles N.W. of Düsseldorf and 4 miles from the left bank of the Rhine. Its importance dates from the introduction of silk and velvet working by religious refugees in the 17th and 18th centuries. Its trade now amounts to nearly £3,000,000. The chief industries are iron-foundries, machine factories, railway repairing-shops, and its chief productions spirits, soaps, chemicals, etc.

Kremenchug, a Russian town on the left bank of the Dnieper, nearly 70 miles S.W. of Pultava, in which government it is situate. A railway tubular

bridge 1,081 yards long joins it to its suburb on the right bank of the river, and there is also a bridge of boats. Much timber is floated down the river, and there is a great trade in salt and tallow. Agricultural machines, carriages, wool, and leather are also articles of trade. There is good fishing in the Dnieper.

Kreuzer, or KREUTZER, the name of several German coins of silver or copper. The kreuzer of Frankfort was worth about the sixtieth part of a gulden, or one-third of an English penny. The Austrian coin of this name is worth one-fifth of an English penny.

Kriegspiel (WAR-GAME), a game of German origin, introduced in 1824 by Lieutenant von Reiszwitz, played with maps of a large scale and metal blocks coloured red and blue, representing bodies of troops of all kinds. An umpire, with two assistants, superintends the game, which is generally played by two persons with alternate moves. It roughly represents actual military operations, and the players are subject to general rules and special conditions. The game is played largely in the German army, and occasionally in England.

Krilof, IVAN ANDREOVITCH (1768-1844), a Russian writer and fabulist, who has been called the La Fontaine of Russia. He was born at Moscow, and, losing his father in 1782, he entered a public office, where he remained till 1788, when he quitted it for a literary career. Prince Sergius Galitzin made him his secretary, and in 1806 he received a Government appointment at St. Petersburg and an appointment in the Imperial Library in 1821. The latter part of his life was spent in comfort, and, as he was of desultory habits and careless of fame, he lived in much content. Some of his fables were published in the *Moscow Spectator* in 1805, and a collection of twenty-three was published in 1809, and followed by a further collection of twenty-one in 1811. His humour, satire, and deep sympathies won him general esteem, and his funeral was the occasion of a great display of admiration. He is commemorated by a bronze statue in the Summer Garden.

Kris, KREES, or CREESE, the national weapon of the inhabitants of the Malay Archipelago, is a kind of dagger. It is made in different sizes and shapes, and is worn by men of all ranks, some, indeed, wearing several, and in Java some women wear it. The kris is frequently ornamented and decorated.

Kronstadt, a trading town of South-East Transylvania, 261 miles S.E. of Pesth, on a line of railway, and near the Carpathians. It is about 1,800 feet above sea-level, and has a very mixed population of Saxons, Magyars, Czechs, Roumanians, Greeks, Armenians, and gypsies. Iron is largely manufactured here. [CRONSTADT.]

Kropotkine, PETER, PRINCE (b. 1842), Russian Nihilist, was born in Moscow. At the age of fifteen he joined the Corps of Pages, and at a later period served for five years in Siberia, where he made explorations. In 1867 he studied mathematics for

some time at the university of St. Petersburg, and became secretary of the Geographical Society. In 1871 he studied the glacial *débris* of Sweden and Finland, and in 1872, during a visit to Belgium and Switzerland, he became a member of the International. In 1874 he was arrested in Russia, escaped to England in 1876, expelled from Switzerland in 1881, and in 1883 imprisoned in France. On his release in 1886 he returned to England. He has written many articles in encyclopædias and elsewhere, and published *Paroles d'un Révolté* in 1885 and *In Russian and French Prisons* in 1887.

Kru (KROOMEN), a Negro people of South Liberia, whose territory extends for 220 miles along the Grain Coast; they appear to be of Mandingan stock, and are remarkable for their extraordinary physical strength and energy. Being also excellent boatmen and sailors, they are largely employed as crews by European vessels plying between the tropics on the West African seaboard. Kru, sometimes supposed to be the English word "crew," is really a corrupt form of *Krao*, the correct tribal name.

Krüdener, BARBARA JULIANA VON (1766-1824), author and religious enthusiast, became enamoured of mysticism, and taught and preached, the Czar Alexander being one of her hearers. She then went from country to country, and finally retired to her estates at Riga, where she became attached to the Moravians. Her Greek sympathies brought her into trouble, and she died in the Crimea.

Kruger, S. J. PAUL, President of the South African Republic, was born in 1825, and was elected President for the first time in 1882. In 1883 he was re-elected for five years, and again in 1888, 1893, and 1898. He was regarded as one of the least progressive of the Boers, but showed extraordinary ability in dealing with the British Government prior to the outbreak of the war (1899). He left Pretoria, as the British arms were successful, and in 1900 came over to Europe, where he was received with enthusiasm in France and Holland. He took no part in the negotiations leading to peace, which was finally agreed upon in May, 1902. He died at Clarens, in Switzerland, in 1904; his body was taken back to the Transvaal, where it received a state funeral.

Krunsenstern, ADAM IVAN VON, Russian seaman and traveller, born in 1770 at Haggud, Esthonia, commanded in 1803-6 the first Russian scientific and commercial voyage round the world, of which he published a most valuable account. He died at Ass, Esthonia, in 1846.

Krupp, ALFRED (1812-87), the founder of the immense iron and steel works at Essen (q.v.). He was born at Essen, where his father had set up a small iron foundry in 1810. He succeeded his father in 1848, the foundry then being still small and in a languishing condition. The discovery of the Bessemer process of converting steel and the invention of the Nasmyth hammer gave a great impetus to the demand for large forgings, and Krupp took full advantage of this demand, and

started the first Bessemer works and the first steam hammer in Germany, and was, moreover, the first to introduce the manufacture of steel guns, going on till he finally sent out guns of 100 tons and upwards, the first 100-ton gun being produced in 1880. He had already cast a steel block of 20 tons in 1862, and ten years later he cast one of 52 tons. The works at Essen are on a gigantic scale, employing a small army of workmen, and are still increasing under the management of the son of the above, who built a 135-ton gun for the fort of Cronstadt.

Kubachi, a branch of the Lesghian people, Kaitagh Mountains, Daghestan, East Caucasus. The name means "forgers of arms," and for centuries they have been famous for their skill in working the metals, and especially in making swords and coats of mail. Although for many generations Mohammedans, they have traditions of a time when they were Christians, and ruins of churches have been discovered, some dating back to the beginning of the 13th century.

Kubla Khan, the Grand Khan of the Mongols and founder of the Mongol empire of China, lived in the 13th century, and was the grandson of Genghis Khan. In the middle of the century he conquered North China—known to poets and early travellers as Cathay—and on the death of his brother was proclaimed "Great Khan," though not without incurring rivalry in the persons, first, of his brother Arikbuka, and then of another relative, whose opposition lasted throughout the reign. Kubla Khan was an energetic, enlightened ruler, adopting the Chinese civilisation, patronising literature, favouring the Buddhist religion by creating the office of Grand Lama, and in other ways. He overthrew all and sundry of his enemies, and possessed the most extensive of Asiatic empires, his sway extending from the Arctic Ocean to the Straits of Malacca, and from the Corea to Hungary. His was the first foreign dynasty to establish itself in China. Marco Polo visited his court, and his achievements gave rise to one of the opium-born fragments of the poet Coleridge, who tells us how—

"In Xanadu did Kubla Khan
A stately pleasure-dome decree,
Where Alph the sacred river ran
Down to a sunless sea."

Kubu, a savage people of Sumatra, who roam the solitudes about the Jambi and its affluents; appear to be akin to the Orang Abung, who are the aborigines of the Lampongs district. Stouter and taller than most other Sumatrans, they occupy an extremely low grade of culture, wearing no clothes beyond a few strips of bark, daubing the body with mud to protect it from the sting of insects, dwelling in frail huts made of branches or even in the hollow trunks of trees, eating reptiles, roots, and wild berries, without any chiefs or tribal organisation, but living in small family groups, and wandering from place to place accompanied by huge dogs, who warn them against the approach of men or beasts. (H. Forbes, *The Kubu of Sumatra*, in *Journal of the Anthropological Institute*, 1884.)

Kuenen, ABRAHAM (b. 1828), a Dutch theologian, born at Haarlem and educated at Leyden, where in 1855 he became a professor. His bold and original methods of criticism of the Scriptures wrought a revolution in Biblical criticism. His *Historisch-Kritisch Onderzoek naar het Ontstaan en de Verzameling van de Boeken des ouden Verbonds* was published in 1861-65, and in part translated by Colenso. He published a second edition of this work, also *De Godsdienst van Israel tot den Ondergang van den Joodschen Staat* (translated into English), and *De Profeten en de Profetie onder Israel*. He also wrote many articles and lectures on national and universal religions. He died in 1892.

Kuen Lun, a great mountain-chain of Central Asia to the N. of the Great Plateau of Thibet, starting from the Pamir plateau, forming a curve to the N., and extending from long. 82° to 94° E. Having a width of 100 to 150 miles, with peaks rising to a height of 25,000 feet, and passes elevated to as much as 18,000 feet, it abounds in glaciers, and is liable to storms of snow and sand. The population is small, and the nomads occupying the upper valleys are pastoral.

Kufic Coins, name of early Mohammedan coins bearing inscriptions in the Kufic character—that is, in the epigraphic Arabic writing of Mohammed's time, named from the old city of Kufa (Cufa), south of Babylon, where the best copies of the Koran (q.v.) were written. Some bear the names of kings, califs, and governors not mentioned elsewhere.

Kugler, FRANZ (1808-58), a German art-historian, was born at Stettin, and studied at Berlin and Heidelberg. In 1833 he became professor at the Academy of Art and teacher in the university of Berlin. Besides poems, and a *Life of Frederick the Great* (1840), he published a *Handbook of the History of Painting from the Time of Constantine* (1837), a *Handbook of Art-Works in the Middle Ages in Prussia*, and a work upon colour in architecture and Greek sculpture.

Kuhhorn, ALPENHORN, or ALPHORN, a musical instrument formerly used by the Swiss to convey signals, now used by cowherds. Its length varies from 3 to 8 feet. It has a cupped mouthpiece, and the tube is nearly straight, but, curving at the end, widens into a bell. Instruments similar to this are used in Sweden, India, and South America.

Kuki, aborigines of North-East India, contiguous with the Nagas on the Burman frontier, are a branch of the Lushais, with eleven main divisions, numerous minor groups, and collective population of about 70,000, scattered over a territory some 7,000 square miles in extent. Each tribe is governed by a "king," assisted by a Council of Elders, and all are distinguished by some difference in their scanty costume. They worship the spirits of the elements, of rivers, forests, mountains, maladies, above all of whom is the great spirit Puthen, who is friendly to men, but knows all their acts, and judges and punishes the wicked both in this and the next life. (Dalton, *Ethnology of Bengal*.)

Kulja, a town of Zungaria in Central Asia, on the Ili, which rises in the Tian Shan Mountains and flows N. into Lake Balkhash, at the foot of the Irenkhabirga Mountains, and on the road from China to Western Turkestan. The town is mostly inhabited by Chinese, and is in a fertile district which is productive of corn, cotton, fruits, rice, tobacco, and wine; while its pastures support large herds of horses, camels, cattle, and sheep. New Kulja, twenty-five miles to the west, was destroyed by rebels in 1866.

Kulm, a village of Bohemia, at the foot of the Erzgebirge, and three miles N.E. of Teplitz. Here in August, 1813, the French fought against an allied army of Prussians and Russians. On the first day of the battle the advantage was with the French, under Vandamme, but the Prussian army was reinforced in the night, and Vandamme was forced to capitulate after losing 20,000 men.

Kum, a walled city of Persia, on the road between Ispahan and Teheran, S. of the Kuru Kuh range, and 85 miles S. of Teheran. It is one of the most sacred cities of Persia, containing the tomb of Fatima, sister of the great Imaum Riza, and being consequently visited by crowds of pilgrims. The desire of the faithful to be buried there has transformed the town and neighbourhood into a huge cemetery.

Kumans, a historical people of Turki stock, who formerly occupied the South Russian steppes, but were driven west by the Mongols in the 13th century, when about 40,000 crossed the Carpathians and took refuge in Hungary. Here they occupied the two districts of Great and Little Kumania in the north-west, where they became completely assimilated to the Magyars. Those left behind in Russia were sold into bondage by the Mongols, and many of the Mamelukes, who became the virtual rulers of Egypt, were descended from these captives.

Kumaun, a district of the North-Western provinces of India, having an area of 6,000 square miles. Part of it lies on the southern slopes of the Himalayas, and has a number of summits ranging to a height of 20,000 feet, and below this lies a great waterless jungle from 10 to 15 miles broad, and only broken here and there by the clearings of the hill tribes. The region produces iron, copper, lead, gypsum, asbestos, and tea. The capital is Almora, and the inhabitants are mostly Hindus.

Kumquat, the fruit of *Citrus japonica*, a small orange, not larger than many gooseberries, with sweet rind and sharp acid pulp. They are candied and exported from Canton in 3-lb. jars.

Kumi, i.e. "Men," the most numerous hill tribe of North Arakan, on both sides of the Kolading river; two main divisions, Kumi proper and *Kami*, with twenty-seven minor groups and collective population of 12,000; appear to be akin to the Kuki (q.v.), although the tribal relations in this region are greatly obscured by the confused and puzzling nomenclature.

Kunama (BAZEN), aborigines of Upper Nubia, province of Kassala, about the Mareb and Takazze affluents of the Nile; about 150,000 in a territory over 6,000 square miles in extent. All are still pagans of Negroid type, who, like the neighbouring Barea, have hitherto maintained their independence both against the Abyssinian Christians on one side and against the Arab Mohammedans on the other. Hence a perpetual state of warfare, which has earned them a bad name, and which makes them extremely jealous of any strangers penetrating into their territory. Matriarchal practices still survive amongst these rude tribes, who, from their speech, appear to be originally Hamites, despite their extremely dark complexion and other Negro features. (James, *Wild Tribes of the Sudan*, 1883.)

Kunersdorf, a Prussian town in the province of Brandenburg, near Frankfort-on-Oder, 40 miles E. of Berlin. Here Frederick the Great received an important defeat on the 12th August, 1759, in the course of the Seven Years' War.

Kunjara, a people of East Sudan, who were the ruling element both in Darfur and Kordofan before the arrival of the Egyptians. They are a branch of the Fur race, from which Darfur (Dar-Fur = Fur-land) takes its name; irregular features, very dark complexion, rude habits, speech apparently akin to that of the Nubas of Kordofan.

Kupfer Nickel, an important ore of arsenic, which consists of the arsenide of nickel (NiAs). It does not contain any copper, though its name apparently indicates this metal. It occurs largely in Saxony, Norway, Connecticut, Cornwall, and other localities as a hard copper-coloured mineral of specific gravity 7.5, which sometimes occurs crystallised in forms belonging to the hexagonal system.

Kurama, a Tatar people of East Turkestan, province of Syr-Daria, are Kirghiz who have abandoned the nomad state and become agriculturists, intermingling with the Uzbeks and the Sartes; population, 78,000, mainly confined to the Kurama district about the Chirchik and Angren rivers.

Kurdistan, a geographical district of Central Asia, lying partly in Persia and partly in Turkey in Asia. The Euphrates forms its western boundary. The Turkish portion, which is watered by the Great Zab, is varied by high mountains clothed with thick forests, and by fertile valleys which produce corn, rice, sesame, cotton, fruits, honey, tobacco, and wax; while in the hills are found sulphur, orpiment, and alum. The Persian district is part of the ancient kingdom of Media, and, though mountainous, is fertile, producing wheat, barley, rice, hemp, flax, sesame, cotton, fruits; while there is much rearing of horses, camels, cattle, sheep, and goats. With regard to the district at large, game is abundant in the mountains, and the panther, bear, lynx, jackal, hyena, and fox are numerous. In the valley of the Kermonchah woollen goods, goat's hair, felts, and carpets are largely worked. The country is very ancient, and was the seat of much mythological history. The

original people, known variously to the ancients as Curdi, Gordi, Gordyzi, Gordiani, and Carduchi, came into contact with Xenophon during his famous retreat. Timour conquered them in 1388, and they now number about a million.

Kurds, the *Karduhi* of Xenophon, a branch of the Iranian Aryans, who form the bulk of the population in Turkish and Persian Kurdistan ("Land of the Kurds"), but who are also found in scattered groups in Khorassan, Asia Minor, and Syria; social organisation still essentially tribal, hence divided everywhere into clans and septs.

Kuriles, the aborigines of the Kurile Archipelago between Kamchatka and Japan.

Kuriles, THE, a chain of twenty-six islands extending for nearly 800 miles, from Cape Lopatka, S. of Kamchatka, to the E. of Yesso in Japan, and separating the Sea of Okhotsk from the Pacific Ocean. In 1875 Japan surrendered the southern part of Saghalien to Russia, and received in return the Northern Kuriles. The largest islands are Iturup and Kunashiri, which are visited by seal-hunters. A small remnant of pit-dwellers—said to have come originally from Yesso—is to be found, and there are a few Japanese and other inhabitants; but most of the islands are only visited for the summer fishing.

Kuroki, GENERAL, Commander of the First Japanese Army in the Russo-Japanese War (1904). He greatly distinguished himself by his victory at the battle of the Yalu, and the subsequent operations against Kuropatkin.

Kuropatkin, GENERAL, Commander-in-Chief of the Russian army in the Russo-Japanese War (1904). Despatched to the Far East at a very critical time after the disasters at Port Arthur, he found himself in a position of great difficulty. Attempts to relieve Port Arthur failed, and in June, 1904, Kuropatkin was himself attacked on all sides. In face of great difficulties, he executed a masterly retreat from Liao-yang, but was unable to do more than retire on Mukden, where he was heavily defeated in March, 1905; he then resigned his command, and was succeeded by General Linievitch.

Kurrachee, the capital of the district of the same name in Sindh, is the chief port for the Punjab, and is situated at the extremity of the Indus delta and close to the frontier of Baluchistan. It is the terminus of the South Punjab and Delhi railway, being 116 miles distant by rail from the latter town, though only half that distance direct. The large harbour is sheltered by a breakwater and a reef, at the end of which is a fixed light. The minimum depth of water on the bar is 20 feet, and the landing-place on Kamari island communicates with the town by the Napier mole, three miles long, which was constructed in 1853. Nearly half a million has been spent on harbour improvements. There is a Frere Hall, with museum and library, and near the cantonments to the E. and N. is a public garden of 40 acres. The water supply is good, and the town is healthy. The trade, to the amount of seven millions annually, consists of the export of cotton

from Sindh and the Punjab, wheat and oil-seeds, and an inland trade with Afghanistan and Baluchistan. There are also iron-works and cotton-presses. The Kurrachee district contains 14,115 square miles.

Kursk, a Russian government in the middle of South Russia, contains about 18,000 square miles, and is watered by tributaries of the Dnieper and Don. About three-fourths of the surface is arable, and the district produces chalk, iron-stone, mill-stones, and potter's clay. There are many barrows. The capital, Kursk, is 312 miles S.W. of Moscow, and is celebrated for the Easter fair, Korennaya, held near it, where transactions to over the amount of £1,000,000 till recently took place. The chief industries are tanning, and soap, candle, tobacco, and spirits manufactures.

Kurumbas, aborigines of the Nilghiri Hills, South India; one of the most degraded types of the human race—long black shaggy hair, very black complexion, bridge of nose depressed, gaping nostrils, projecting jaws, low stature, wild expression; seem to represent a primitive Negrito element, but now speak a rude dialect of the Malayalam (Dravidian) language.

Kutenays (KUTANIS), North American aborigines of British Columbia, about the northern fork of the Columbia river, and thence southwards along the Kootenay river, named from them; speak a stock language unrelated to any other in North America; chief divisions, Upper Kutenay, Lower Kutenay (Akoklako), Klanoh-Klatklam (Flathead Kutenay), Yaketahnoklatakmanay; are at present reduced to less than 1,000 souls, of whom about 400 are in the Flathead Agency, Montana, and 500 at Kutenay Agency, British Columbia.

Kutosoff, MICHAEL LARIVONOVITCH (1745–1813), Field-Marshal and Prince of Smolensk, studied at Strasburg, where he displayed great fondness for literature, a taste which remained with him throughout his military career. At the age of sixteen he entered the artillery, and mounted rapidly, but lost an eye in one engagement, and was again severely wounded in another. In 1791 he won the battle which led to the Treaty of Jassy. Catherine II. sent him on an embassy to Constantinople, and made him Governor of Finland, Paul I. employed him on many missions, and Alexander I. made him Governor of St. Petersburg. He fought at Austerlitz, and was engaged against the Turks in 1809. In 1812 he was opposed to Napoleon, and was defeated at Moskowa, but his Fabius-like policy stood him in good stead, and he won the name of Smolenski at the battle of Kranoi. He followed the French retreat into Germany, where he died. He stands next Suwarrow in reputation, and was known as “the Saviour of Russia.”

Kutzo-Vlachs, an isolated group of Rumanians on both slopes of the Pindus range, Balkan Peninsula, mixed with numerous Albanian and Greek elements, speak a corrupt Rumanian dialect, which the Rumanians of Wallachia and Moldavia have much difficulty in understanding. Kutzo-Vlach, meaning “Crippled Wallachians,” is a term of

contempt applied to them by the Greeks; population about 200,000.

Kuy, aborigines of Camboja, called *Khmer-dom*, i.e. “original Khmers” (Cambojans), and regarded as the primitive stock of that race; eight divisions, chiefly N. of the Great Lake about the frontiers of Camboja and Siam; are noted workers in iron; speak several distinct and mutually unintelligible idioms, but are gradually becoming absorbed in the surrounding Cambojan and Siamese populations.

Kyanite, a mineral silicate of alumina, $Al_2O_3SiO_2$, crystallising in the Anorthic system in long crystals often twinned, translucent, glassy and various in colour, infusible, unaffected by acids, and with a hardness of 7 and a specific gravity of 3.5–3.7. It occurs especially in metamorphosed slates.

Kyoto, or KIOTO, for a thousand years the capital of Japan, 26 miles inland from Ozaka, stands on a plain divided by a lofty range of hills from Lake Biwa to the E. There are some fine temples on these hills, and beneath lies the town, whose main streets are parallel to the river Koma, which flows at the base of the ridge. Kyoto is the centre of the Buddhist faith in Japan, and there are Buddhist temples at the S. end of the city. At the N. end are wooden buildings, formerly inhabited by the emperors. The town produces embroidery, enamels, inlaid bronze, brocades, crapes, velvets, porcelain, and pottery, and is noted for its dancing girls.

Kyrie, in full, *Kyrie Eleison* (Greek = “Lord, have mercy”), the title of a short prayer used as a response in early liturgies, and at the beginning of the Roman Mass and the Anglican Communion Service; also the name of a musical setting of the same petition.

Kyrle, JOHN (1664–1724), a philanthropist who lived at Ross, in Herefordshire, and was immortalised by Pope as “the Man of Ross.” On an income of £500 a year he built hospitals and churches, and did other good works. A society formed by Miss Octavia Hill and others for bringing light and sweetness into the dwellings and surroundings of the working-classes and the poor has been called the Kyrle Society.

L.

L, l, the twelfth letter and ninth consonant of the English and Latin alphabets, derived through the Greek *lambda* from the Phœnician *lamed*, and ultimately from the Egyptian hieroglyph of a couchant lion. It is a voiced consonant produced by placing the tip of the tongue against the upper interior gums (as in English), or against the inside of the upper teeth, and then breaking the contact after letting a slight murmur escape over the sides of the tongue. The Welsh *ll* is a kindred voiceless sound, a strong audible breath passing over the sides of the tongue just before the contact is broken. At the end of monosyllabic words this letter is written double after single vowels. Sometimes *l* before a consonant and after *a* modifies the *a*, as does final *ll*, except in *shall*, e.g. *halt*, *salt*, *falter*.

appalling, taller, call, fall; and sometimes *l* in the middle of a word is silent after the broad *a*, as in *calf, half, calm, palm*. The sound in the French word *mouillée*, the Italian *gl*, is nearly English *ly*. The *l* murmur, or sonant *l*, is often written *le* in English, as in *sickle, single, little, fiddle, simple, double*, and unaccented *al, el*, often have this sound. The voiceless *l* murmur is heard in the French *temple*.

Labarum, the famous Imperial standard of Constantine the Great after his vision of the cross and his conversion to Christianity. It is usually represented as a pole with a cross-bar, on which hung a purple banner with the Greek letters *X P* (*Chr*, the beginning of *Christos*) interlaced.

Labiatae, the fifth largest natural order of Dicotyledons (q.v.), including nearly 3,000 species under about 140 genera. They are mostly natives of warm or temperate regions, are all herbs or undershrubs, and have in almost all cases aromatic carminative volatile oils. They have stems which are generally square; opposite, decussate, exstipulate leaves; flowers in verticillasters (q.v.); a persistent gamosepalous calyx of five sepals, a bi-labiate gamopetalous corolla of five petals; didynamous stamens; and two carpels, splitting into four one-seeded superior nutlets, with a gynobasic style. Mint, sage, lavender, rosemary, and thyme are familiar representatives of the order.

Labiate, or **LIPPED**, is practically an abbreviation of bi-labiate, being a term applied in botany to gamophyllous calices or corollas in which widely-gaping lateral sinuses divide the limb into two lips. In the corolla of the order Labiatae (q.v.) the posterior lip is composed of two petals and generally forms a hood over the essential organs, while the anterior lip, of three petals, known as the *labellum*, is the landing-place of the fertilising insect visitants. In honeysuckle the posterior lip consists of four petals and the anterior of one only, both lips being reflexed.

Labrador. [NEWFOUNDLAND.]

Labradorite, a variety of plagioclase felspar (q.v.), named from Labrador, where it occurs in great quantity in rocks of Archæan age. It contains about 53 per cent. of silica, 30 per cent. of alumina, 12 per cent. of lime, and nearly 5 per cent. of soda. It is generally grey, and exhibits a rich play of colours, chiefly blue and green, due to included fibres, for which reason it is sometimes used in jewellery. $H = 6$, $S.G. = 2.67 - 2.76$. It is a constituent of basalts and diabases.

Labrador Duck (*Somateria labradorica*), a large duck allied to the Eider Duck, now extinct, but formerly valued for its down. The last-known specimen is said to have been killed in Halifax harbour in 1852. A few examples are preserved in museums.

La Bruyère, JEAN DE (1645-1696), the author of the *Caractères*, published in 1688, was a very distinguished French writer. The satires in his work made many enemies, but he was, after being twice rejected, elected to the French Academy.

His other work, *Dialogues sur le Quietisme*, did not attain the popularity of the *Caractères*.

Laburnum (*Cytisus Laburnum*), a favourite tree in our gardens, belonging to the pea tribe and to the same genus as the broom (q.v.). It is a native of the south of Europe, and was introduced into England in the 16th century. The heart-wood is very dense and dark-coloured, resembling ebony, and is used in turnery. The leaves have a white down beneath, which, with the downiness and many-seeded character of the pods, distinguishes the tree from the so-called Scotch laburnum (*C. alpinus*). *C. Adami* is a hybrid between the laburnum and the shrubby *C. purpureus*, perhaps originating in a graft (q.v.). The roots and leaves of laburnum are poisonous, and the seeds dangerously so. They contain two poisonous alkaloids, *cytisin* and *laburnin*, and have a powerful emetic action.

Labyrinth, in classical antiquity, was a building full of intricate passages. Of mythical labyrinths the most famous was that constructed by Dædalus for Minos, King of Crete, and inhabited by the Minotaur, which devoured all who entered. The name was afterwards applied to real buildings of the same character, such as the Egyptian labyrinth, near the town of Arsinoe. In modern gardening a labyrinth, or "maze," is a series of intricate walks enclosed by high and thick hedges, which makes it difficult to recover one's way when it has been lost. The most famous in England is that at Hampton Court.

Labyrinthodonta, an extinct order of Amphibia (q.v.), of which *Archegosaurus* in the Coal-measures is perhaps the oldest known, and *Labyrinthodon*, in the Trias, the most recent. They all possess tails, and some seem to have been serpentine-form, and possibly devoid of limbs. Much of the skeleton was cartilaginous, and is therefore unknown to us: the occipital condyles were often permanently so; and in *Archegosaurus* the notochord persisted, and we have only bony rings in the vertebræ as in a tadpole. A dermal armour of scales occurs in many genera. The name is derived from the labyrinthine involutions of the walls of the teeth in some genera. The large footprints in Triassic rocks formerly known as *Cheirotherium* are almost certainly those of *Labyrinthodon*. As the skull is in some cases three feet in length and two feet broad, these animals certainly reached a colossal size.

Lac, a resinous incrustation formed on the twigs of various East Indian trees by the puncture of an insect, *Coccus lacca*. The name, meaning a hundred thousand, suggests the number of these insects, which pierce the bark with their proboscides and cover themselves with the resinous exudation. A red fluid collecting in the enlarged ovary of the female insect forms the lac-dye of commerce. Lac encrusting the twigs is known as *stick-lac*, and contains about 68 per cent. resin and 10 per cent. lac-dye. Stick-lac crushed and washed becomes *seed-lac*, and this when slowly melted in a cloth bag and spread out in thin layers on glossy plantain leaves constitutes *shell-lac* or *shellac*. **Lao**

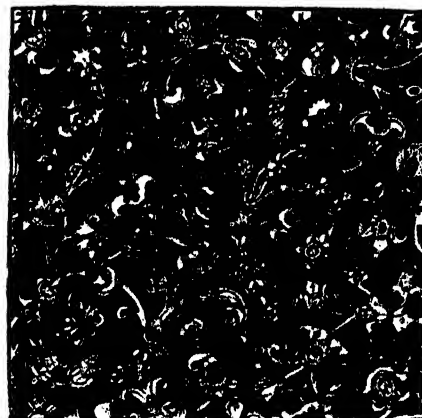
comes chiefly from Bengal, Assam, Pegu, and Siam, about 5,000 tons of shellac being exported annually, mostly to England. Lac is a principal ingredient in sealing-wax (q.v.) and in many varnishes.

Lac-dye is a red colouring matter obtained from *lac* (q.v.). It is usually obtained from the crude *stick-lac* by maceration with water and precipitation with milk of lime. The colour is due to a substance, *Laccic acid* ($C_{16}H_{12}O_8$?), present in the *lac-dye*. It has long been used in the East for silk and wool, and formerly it was very extensively used in Europe, chiefly in combination with cochineal, but later years have seen it diminish greatly in importance.

Lace, a fabric made by twisting, plaiting, knotting, or looping fine threads of linen, cotton, or silk, so as to form an ornamental design. In the different kinds of lace various methods are adopted for filling in the space between the main lines of the pattern (called the "flower" or "gimp") so as to hold it together. One of the commonest "grounds" is a mesh of very delicate texture, resembling a honeycomb, which is termed a *réseau*; its most familiar form is the bobbin-net, now produced by machinery. The pattern and *réseau* may either be worked together, or the former may first of all be made separately, and then stitched down to the *réseau*; in the latter case—e.g. in Honiton lace—the work is called *appliqué*. Sometimes the ground consists merely of single threads called "ties" or "brides," or there may be hardly any ground at all, the design being such that the various parts touch here and there at the edges, and so give one another mutual support.

Lace may be either hand-made or machine-made. Of the former, often distinguished as "real" or "genuine" lace, there are two kinds, *needle* or *point-lace* and *pillow-lace*. Hand-made lace is usually made from linen-threads, whereas in machine-made lace the material commonly used is cotton. The art of making *point-lace* originated in Venice, where it was developed by gradual stages from embroidery-making in the earlier half of the 16th century. The first true lace, as distinguished from embroidery, was the *punto in aria* or *reticella*, which differed from modern lace only in the more elementary character of the work, and the invariable choice of rectilinear or geometrical patterns. The skill of the lace-makers of Northern Italy continued to increase during the next two hundred years, reaching its climax in the rich variety called "rose-point," which was produced in the early years of the 18th century. It consists of flowers and scrolls worked in relief as though they were embossed or carved, and joined together by ties or brides ornamented with *picots* (small loops running along the edge of the tie). From the North of Italy the art was carried to Flanders and France; in the latter country its course was extremely prosperous, and there are few varieties of needle-point which can rival the Alençon lace of the 18th century. Point-lace is made in the following manner:—The design is first of all drawn on a sheet of parchment, which is then stitched down to a piece of stout linen. Linen threads are then placed over the chief lines

of the design, stitches being introduced here and there to fasten them on to the parchment and linen backing. The space within the threads, which form the outline of the pattern, is gradually filled in with button-hole stitches; when this is finished, the



POINT LACE.

stitches by which the pattern is attached to the parchment and linen are cut through, and in this manner the now completed lace is set free.

The manufacture of pillow-lace arose, either in Flanders or in Italy, towards the close of the 15th century. It thrived chiefly in Flanders and in England, where it was introduced by Flemish refugees in the latter part of the 16th century. The new industry was established at several places in the south-western counties, the most important being Honiton in Devonshire. Although the importation of foreign lace was prohibited from the reign of Charles II. onwards, smuggling was carried on extensively, and much of the lace sold as Honiton was really made in the Low Countries. Pillow-lace is so called because the worker holds on her knees a pillow with a piece of parchment fixed to it on which the pattern has previously been drawn. The parchment is pierced with holes at certain points on the outline of the pattern to mark the place where pins are to be inserted; this is an operation requiring special knowledge and skill. When the pins have been placed in the holes, the threads of lace are plaited and twisted round them from a large number of small bobbins. Sometimes as many as 1,200 bobbins are used, and the work is so intricate that the skilled lace-maker completes only about one inch in three weeks. Amongst the more important foreign laces of this class are those of Mechlin and Valenciennes. Mechlin lace is celebrated for its *réseau*, which is composed of a number of hexagons, four of the sides consisting of double twisted threads, while in the two others the threads are plaited three times.

Machine-made Lace. Much ingenuity has been shown in the invention of machinery for making "imitation" lace, but, from an artistic point of view, work which merely consists of threads twisted together can never compete with that which is produced by means of the button-hole stitch or the regular plait. The manufacture of lace in this manner grew up in the 18th century, the first machine used for the purpose being the hosiery-frame, by means of which it was found possible to

produce the net or mesh. The greatest advance was the invention of the Leavers machine (1813), which is now used at Nottingham and other centres of the lace industry. In spite of the inferiority of machine-made lace, it has driven hand-made lace almost completely from the field, and the attempts to revive the art in Ireland, at Honiton, and elsewhere have met with but scanty success.

Lacertids. [LIZARD.]

La Chaise, FRANÇOIS D'AIX DE (1624-1709), an ardent Jesuit, became the confessor of Louis XIV. in 1675. In the contest between Jansenists and Jesuits (q.v.), he avoided a violent position and maintained the king's favour until his death.

Lachrymal. [EYE.]

Lacquer, a varnish of two kinds. (1) That applied to brass and other metals to preserve them from corrosion and tarnish consists of shell-lac or seed-lac dissolved in alcohol, with the addition of certain gum-resins and some colouring matter, such as gamboge. The metal surface is usually coated twice; the first coat may be applied when it is either hot or cold, but it is invariably heated before receiving the second. (2) The lacquer used for decorative woodware is derived from the juice of the *Rhus vernicifera*, or "lacquer-tree," which is prepared in various ways, according to the kind of lacquerware desired—e.g. for gold lacquerware it is mixed with about 30 per cent. of powdered gold. The processes followed in applying the successive coats of lacquer are extremely elaborate and slow. Frequently a design in relief in one kind of lacquer is placed upon a ground consisting of another kind. It is also common to carve the surface or to inlay it with plaques of metal, ivory, or mother-of-pearl. The art of lacquering has been carried to the highest degree of perfection in Japan, where it has been practised for at least a thousand years.

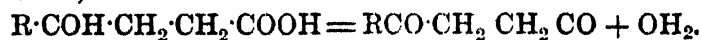
Lacrosse, a Canadian game, originally derived though in a much ruder form) from the Indians. It is played with a *crosse*, a stick about 6 feet long, curved at one end like a bishop's crozier (whence the name), and an indiarubber ball from 8 to 9 inches round. The game was introduced into England in 1867.

Lactic Acid. This acid is present as a constituent of very many natural products, as in the sap of the vine, in certain parts of the body, and in fermented liquids. It occurs in sour milk (hence name), being formed by the fermentation of the milk-sugar, and in this source it was first discovered in 1780 by the Swedish chemist Scheele. It is best prepared by the fermentation of sugar, induced by adding some putrid cheese, sour milk, and zinc carbonate to the solution of sugar and allowing it to stand in a warm place. The sugar first forms *glucose*, and this breaks down according to the equation $C_6H_{12}O_6 = 2C_3H_5O_3$. It may also be prepared by numerous synthetic methods, which prove its constitution to be $CH_3 \cdot CH_2 \cdot OH \cdot COOH$, or *hydroxy propionic acid*. It is a colourless, thick liquid soluble in water, and of specific gravity 1.2. Besides this ordinary lactic acid, an acid of

precisely the same constitution is obtained from flesh, called *sarco-lactic acid*, which only differs from the previous acid by acting on polarised light. [ISOMERISM.]

Lactometer is an instrument for testing the quality of milk. One form of lactometer is a hydrometer to which is attached a scale about five inches long, the zero of which marks the point to which it just sinks in water. Another point on the scale corresponds to an average quality milk, and according as this mark sinks below or rises above the level of the milk, the milk is said to be more or less diluted with water. The instrument is not scientifically accurate, as the addition of either cream or water would cause the instrument to sink. Another form is a simple glass tube graduated in 100 parts. New milk is poured in and left to stand. The cream rises, and its height gives the number of parts of cream in 100 parts of milk. Sets of these tubes are used by farmers for comparing the quality of the milk given by different cows.

Lactones. Organic acids which contain a hydroxy group as well as the acid group CO_2H frequently undergo a change with the elimination of water and formation of a chain compound. Thus,



The chain compounds are known as lactones, and furnish many important chemical products.

Lactose, or MILK-SUGAR, is a member of the sugar group carbohydrates, and is closely allied to cane-sugar. It has the chemical composition represented by $C_{12}H_{22}O_{11}$. It forms a crystalline solid soluble in water and possessing a sweet taste, though not so sweet as that of cane-sugar. It acts on polarised light, being dextro-rotatory. [POLARISATION.] It does not ferment, yielding alcohol under the action of yeast; but if boiled with a dilute acid, or subjected to the influence of certain ferments, it yields a sugar *galactose* ($C_6H_{12}O_6$), which then yields alcohol as a product of the yeast fermentation. It, however, undergoes fermentation under the influence of an organism known as *bacillus acidi lactici*, present in sour milk or putrid cheese, and yields *lactic acid* (q.v.), and on further fermentation *butyric acid*. As lactose is itself present in milk, this fermentation is the cause of milk turning sour when exposed to air. [SUGARS, CARBOHYDRATES, FERMENTATION.]

Lady Birds, or COCCINELLIDÆ, a family of small variously coloured beetles. They are usually black, with red or yellow spots, or *vice versa*. They are of the greatest service to agriculturists, as they feed on plant lice (*Aphides*).

Ladybrand, a town in the Orange River Colony, about 50 miles E. of Bloemfontein. During the Boer War (1899-1902) it underwent a siege, but was eventually relieved.

Lady-Day, the Feast of the Annunciation of the Blessed Virgin (March 25). It is a quarter-day in England and Ireland.

Lady's Mantle, the popular name of the rosaceous genus *Alchemilla*, especially *A. vulgaris*, from its roundish, 7- to 9-lobed, plaited, and serrate leaves. Those of some alpine species have long silvery hairs. Root-pressure bedews the teeth of the leaf with drops of water. The stipules are ochreate (q.v.), and the minute greenish flowers, which are numerous, are interesting from their symmetry being often tetramerous, their ring-shaped perigynous disk, and their solitary one-seeded carpel on a gynophore (q.v.), with a lateral style and forming a single achene (q.v.). The common species is administered as a tonic by herbalists.

Lady's Slipper (*Cypripedium Calceolus*), formerly known as *Calceolus marianus*, one of the rarest of British orchids. The genus includes some fifty species from various tropical and temperate regions. The large inflated lip-petal gives its name to the group, and it differs from other orchids in having the outer anterior stamen aborted and two inner lateral ones polliniferous. There is also a pedicellate 3-lobed discoid stigma. Many of the species are favourite stove-plants.

Ladysmith, a small town in the N. of Natal, with a population of from 3,000 to 4,000. Shortly after the outbreak of the war between Great Britain and the two Republics of the Transvaal and the Orange Free State, Ladysmith was the scene of severe fighting; the town was finally invested by the Boers, and besieged for 120 days, when it was finally relieved by General Buller on Feb. 28, 1900.

Lafayette, MARQUIS DE (1757-1834), took a leading part in the American War of Independence; he was entrusted by Washington with the defence of Virginia, and took part in the battle of Yorktown. After the war he returned to his native country, and endeavoured to make his influence felt in the French Revolution; he was disliked, however, on account of his moderation, and was in 1796 captured by the Austrians. Liberated by Bonaparte, he again entered the field of politics after the latter's fall.

Lafontaine, JEAN DE (1621-1695), passed a very uneventful life at Paris. His great works, the *Contes et Nouvelles en Vers* and the *Fables*, appeared in 1665 and 1668. In 1684 he was elected to the Academy.

Laforey, SIR JOHN, BART. (1729-1796), British naval officer, took part in Keppel's action off Brest in 1778, and in the following year was made commissioner at Antigua. He effected the reduction of Tobago, and returned to England in 1793, but in 1795 was re-appointed.

Lagomys, the only living genus of the Double-toothed Rodent family Lagomyidæ, with eleven species, known as Pikas or Calling Hares, and about the size of guinea-pigs. They are chiefly from the north of Asia and America, though one form, the Alpine Pika (*L. apinus*), ranges into south-eastern Europe. The sable-hunters are said to appropriate the stores of the Alpine Pika to feed their horses.

Laissez Faire, a system of State policy which consists in refraining from legislation on economic and social matters, on the ground that national welfare is best promoted by allowing free scope to individual enterprise. The principle was adopted in a greater or less degree by the French Physiocrats and Adam Smith; and the "Manchester School," the most prominent members of which were Cobden and Bright, urged it with a vehemence which sometimes amounted almost to fanaticism, objecting not only to restrictions on foreign commerce [FREE TRADE], but to all interference with industry on the part of the State, including even the Factory Acts and similar legislation. The term is now used in a wider and more general sense; in fact, it may be regarded as co-extensive with the whole sphere of government. The views on which Laissez Faire, in its full signification, is based may be considered as the outcome of the struggle for individual liberty which culminated in the French Revolution. Since the growth of the theory of Evolution it has been connected with the doctrine of the "struggle for life," and ably advocated by such men as Herbert Spencer and Professors Huxley and Tyndall. Regarded as a system of political doctrines resting on some philosophic basis, the principles of Laissez Faire are usually termed "Individualism" as opposed to Socialism (q.v.).

Lake-Dwellings, a collective name for houses, either isolated or in groups, built on some kind of substructure above the surface of the water, usually of inland lakes. Probably the motive which led to early man choosing such situations for his villages was the sense of security derived from being thus cut off from attack. The first known mention of such dwellings is by Herodotus; but dwellings of this kind go back to even earlier times than those described by the Father of History. In the winter of 1853-54 the attention of anthropologists was directed to the dwellings of the Swiss lakes owing to the water falling below the usual level, and a little later to those of Italy. Dr. Keller considers it "extremely probable that the Swiss lake-dwellings reach back from 1,000 to 2,000 years before our era." From relics found they appear to have been inhabited during the Stone, Bronze, and Iron Ages, and the finds range from stone implements to a coin of the Emperor Claudian. There were three styles of building used in the platforms on which dwellings were erected. (1) Piles were driven into the bottom of the lake, and stones dropped between them to render the structure firm. (2) In some cases the piles were mortised into the trunk of a tree, and then lowered into position. This was chiefly done on sandy bottoms, where the piles if driven would have little hold. (3) The stems and branches of small trees and brushwood were thrown in till a sufficient foundation was laid on which to erect the platform. The last was substantially the plan followed in the erection of the crannogs of Britain and Ireland, though sometimes naturally islands were utilised, and the whole surrounded by a palisade. In 1856 traces of a lake-dwelling were found at Wretham in Norfolk. Ten years later,

some remains possibly of pile-building, with bones, Samian pottery and Roman coins were discovered near London Wall and in Southwark. In 1887 vestiges of such dwellings were met with in Baston Mere, near Bury St. Edmunds, and also on an



LAKE DWELLING.

island supported by piles in Llangorse Lake, Brecknockshire. In 1880 there was a find at Ulrome in Yorkshire, and some three or four years afterwards evidences of a pile-dwelling were found near Preston, in Lancashire. One of the most important finds in Britain was that in 1892, when, about a mile north of Glastonbury, beams and piles closely resembling those of the Scottish and Irish crannogs were discovered. These extend over five acres, and show traces of from 60 to 70 separate dwellings or work-places. There have been found bronze rings, fibulæ, a brooch, a few iron objects much decayed, a quantity of broken pottery, remains of a quern, some stone implements, and flakes and cores of flint. Most of the articles are late Celtic. The age of lake-dwellings is by no means past. They are to be met with at the present day in Africa, New Guinea, and the Malay Archipelago.

Lakes are bodies of water occupying hollows of the land, either with an outlet, when their waters are fresh, or without one, when they are salt. They vary in size from the salt Caspian, 170,000 square miles, to the fresh water Superior, over 30,000 square miles, and Victoria Nyanza, but little less. In elevation they range from Sir-i-kol, the source of the Oxus, 15,600 feet above sea-level, and Titicaca, 12,800 feet, to the Caspian, the surface of which is 85 feet, and the Dead Sea, the surface of which is 1,272 feet below sea-level. In depth, Lake Baikal, with an area of 9,000 square miles—about that of Lake Erie—the largest body of fresh water in Asia, exceeds all others, being 4,080 feet, with its surface 1,360 feet above, and its bottom 2,720 feet below, sea-level. But the bottom of the Dead Sea is 2,580 feet, and that of the Caspian 3,685 feet below sea-level. Lake Como is rather deeper than the Dead Sea, but Tanganyika, Geneva, Superior, and the deepest Scottish lakes are about 1,000 feet in depth. Lakes have originated in a variety of ways. Some are the craters of dormant volcanoes, such as Lake Albano, near Rome. Others, known as *lagoons*, are formed on low sandy coasts by storm-beaches, and are commonly brackish, as in the Landes of Bordeaux. The upheaval of

surrounding land has formed many large lakes, such as the Caspian, the great Equatorial lakes of Africa, and those of Switzerland and Italy, in which animals closely allied to marine forms suggest a former connection with the ocean. The great series of lakes in the St. Lawrence basin, the greatest area of fresh waters on the globe, have been compared to an elevated Baltic. The depression of a plain has been another cause, as in the Jordan valley, with the fresh-water Tiberias 600 feet below sea-level, and the Dead Sea 100 miles farther south and nearly 700 feet lower. The waters of a lake may be held up by ice, like the Merjelen See on the Aletsch glacier, or may have been dammed back by a landslip, a lava-stream, a glacial moraine, or the work of beavers. Hollows produced by irregularities in boulder-clay left on the melting of an ice-sheet, and *rock-basins* scooped out of solid rock on the lower slopes of once glaciated mountains, form the *tarns* of northern mountains. The subsidence of rock-basins along a coast-line has produced fjords (q.v.). Lakes in the course of a river act as filters, and so tend to become choked by the fans of growing deltas carried into them, and they also act as flood-regulators during heavy rain. Salt lakes vary much in salinity and in composition. Aral has less than 11 grams of salt per 1,000, the open Caspian less than 13, Van over 17, the Dead Sea 221, Urumiah nearly 223, and Karaboghaz Bay in the Caspian 285 grams. In the Caspian, Dead, and Urumiah Seas the salt is mainly chlorides of soda and magnesia, with notable proportions of chloride of potash and lime in the Dead Sea; but Van contains a large proportion of carbonate and sulphate of soda, and is thus alkaline rather than saline. Other smaller lakes in Tibet, California, etc., contain borax (q.v.).

Lakes. The term lakes as applied to pigments is derived from an Italian term—*laccæ*, which was given to pigments obtained from dye liquors. In dyeing it is frequently necessary for the formation or fixation of colour to mordant [DYEING] the cloth before or after subjecting to the dye. If, instead of thus forming the pigment in the cloth, the colour material be precipitated as a solid by means of a mordant, the solid material resulting is known as a *lake*, which, hence, usually consists of an organic colouring product united with a metallic salt. A large number of such pigments are known and commonly employed, as, *e.g.* *madder lake*; *alizarin red lake*, formed by mixing a caustic soda solution of alizarin red to a solution of alum with a little calcium chloride; *carmine lake*, *Dutch pink*, and *guercitron lake*, and an innumerable array obtained from the different so-called aniline dyes.

Lamaism, the religion of Tibet and Mongolia, is Buddhism (q.v.) disfigured by the introduction of elements derived from Sivaism and Shamanism. Its cardinal doctrine is that of "the three jewels," the first jewel being the Buddha, regarded as the most exalted of saints; to him is due the second jewel, the "doctrine" or moral law, the only form in which the Buddha exists since his absorption in the Nirvâna; the "priesthood jewel" consists of

the whole company of Buddhistic saints, whether incarnate or purely spiritual and disembodied, and therefore includes the higher Tibetan clergy. Below the saints rank the gods and spirits, including many derived from Sivaism, such as Indra, Yama, Yamāntaka, and Vaisravana. The call to worship is heard three times daily, and, when the clergy have assembled, prayers are offered up and hymns are chanted amidst the most confusing din produced by a variety of musical instruments.

An essential element in Lamaism is the organisation of its hierarchy, in which numerous travellers, from the earliest Jesuit missionaries downwards, have observed a striking similarity to the Roman Catholic system. It owes its present form to the reformer, Tsong-Kapa, who lived in the 14th and early 15th centuries. At the head of the priesthood are the Dalai-lama and the Pantshen, in each of whom a leading disciple of Tsong-Kapa is continually reappearing in human shape. The Dalai-lama and the Pantshen are temporal as well as spiritual rulers, the former being the more powerful. There is also a lower clergy, divided into four orders; the members for the most part live in monasteries.

Lamarck, CHEVALIER DE (1744-1829), was born in Picardy and educated for the Church; he joined the army, however, where he became an officer. Owing to injuries he was obliged to leave and take up miscellaneous work, and in 1773 he began his scientific studies. In 1809 was published his *Philosophie Zoologique*, and from 1815-22 his *Histoire des Animaux sans Vertèbres*.

Lamartine, ALPHONSE MARIE LOUIS DE (1790-1869), was born at Macon; he held diplomatic posts in Italy till the accession of Louis Philippe. Defeated at the elections, he went for a two years' tour in the East, and returning in 1833, sat in the National Assembly until 1848. He became Minister for Foreign Affairs, but retired and took no further part in politics. His principal works were *Histoire des Girondins*, *Souvenirs d'Orient*, and *Histoire de la Restauration*.

Lamb, CHARLES, was born in 1775, in Crown Office Row, in the Temple, where his father was clerk and servant to one of the benchers, Mr. Salt. Mr. Salt, in time, procured for him an admission to Christ's Hospital, and so he became a blue-coat boy, and a friend for life of his school-fellow, Coleridge. On leaving school he took a clerkship at the South Sea House, but soon obtained a better position in the accountant's office at the India House. In 1796 the insanity which was in his father's family sent him for a few weeks to an asylum. He was never attacked again, but his elder sister, Mary, shortly after his recovery, in a fit of frenzy murdered their mother. He at once undertook the responsibility of her guardianship, and for the rest of his life devoted himself to her service, taking her to live with him on the death of their father in 1799. So serious a charge made a heavy demand on his purse, and he turned to literature to eke out his less than scanty income. In 1796 he published some sonnets among the *Poems* of Coleridge, and in 1798, in conjunction with his

friend Lloyd, a volume of verse, while in the same year he brought out a short romance, *A Tale of Rosamund Gray and Old Blind Margaret*. Always devoted to the theatre, he composed in 1799 a tragedy, *John Woodvil*, which he failed to bring out on the stage. His lack of success with this was followed by a cheerful undertaking of lower work. Between 1800 and 1803 he contributed facetious paragraphs to *The Morning Post* and other papers, rising early to compose his jokes before breakfast. In 1806 he again attempted a play, and wrote a farce, *Mr. H.*, which had actually a first night at Drury Lane, where it proved so complete a failure that Lamb himself contributed to the hisses amidst which the curtain fell. Success, however, was near. The *Tales from Shakespeare*, which he and Mary wrote together for Godwin's series of books for children, and published in 1807, obtained immediate and lasting popularity. In 1808 he gave a fine proof of his critical capacity in his *Specimens of English Dramatic Poets contemporary with Shakespeare*. A little later he wrote for *The Reflector*, unconsciously training his hand for his masterpiece, *The Essays of Elia*, which in 1820 he began to contribute to *The London Magazine*. The first series of these essays was published separately in 1823, the second two years afterwards. Their name was borrowed from an Italian who had been their author's fellow-clerk in the South Sea House thirty years before, and they were almost his last literary work, except some selections from old plays and his *Popular Fallacies*, published in 1828. In 1825 he retired from the India House on a pension, and two years later settled at Enfield. In 1833 he moved to Edmonton, his last home, where he died a few months after the death of his old friend Coleridge, on the 27th of December, 1834. Amidst the sadness of his devotion to his often-afflicted sister—which, perhaps, may excuse his one fault, indulgence in drink—he led an outwardly happy life, bringing merriment everywhere with the wit of his conversation and a ceaseless flow of puns. His essays, in their humour and pathos, their quaint and unforeseen turns, are the expression of the mind alike of a true humorist and a true critic.

Lambeth, a parish and parliamentary borough in Surrey, 3,942 acres in area, forming part of the south-west of London. It is connected with Westminster by a bridge 1,040 feet long. It contains Lambeth Palace, the official residence of the Archbishops of Canterbury since the 12th century, where there are valuable MSS. and portraits of the archbishops; and St. Thomas's Hospital. Lambeth is now famous for its potteries. By the third Reform Bill it was divided into North Lambeth, Kennington, Brixton, and Norwood, each division returning one member. Pop. (1901), 301,873.

Lamellibranchiata, a class of Mollusca (q.v.), including those forms which have a bivalve shell, such as oysters, mussels, and cockles. The group is characterised by the absence of a distinct head, from which circumstance it is often known as the Lipocephala; by the presence in most cases of a muscular, more or less triangular, foot, with which the animals can burrow into the bottom of the sea,

pond, or river in which they live; by the complete absence of eyes and of a rasping tongue such as is found in the Glossophora (q.v.). It is divided according to the nature of the adductor muscles, which close the shell, into (1) the Isomya, which possesses two such muscles of about equal size, one anterior and one posterior—e.g. *Anodon*; (2) the Heteromya, where the anterior muscle is much the smaller; (3) the Monomya, in which the anterior muscle is wanting—e.g. the oyster (*Ostrea*). Some of the animals of this group are of considerable importance commercially, not only as articles of food—e.g. the oyster—but also in various other ways. Thus some produce pearls; the shell of others is used for making buttons and other articles. They are also interesting as being among the most ancient forms of life known, their fossil remains occurring from the Cambrian period onwards.

Lamellicornia, the division of beetles including those in which the antennæ or "horns" are broad and flat at the end. The cockchafers are familiar English representatives of the group.

Lamennais, FÉLICITÉ ROBERT DE (1782–1854), a French religious writer, born at St. Malo, and educated with his brother by their uncle, M. des Saudrais. In 1805 he and his brother retired to their estate at La Chesnaie. Here he read much, and became after a time a free-thinker. In 1808, however, his *Réflexions sur l'État de l'Église en France pendant le 18^{me} Siècle* was suppressed on account of its extreme Catholic views. Lamennais was in England during the Hundred Days, and soon after his return was ordained. Between 1821 and 1823 he attracted the attention of the religious world by the publication of his *Essais sur l'Indifférence en Matière de Religion*, which denounced toleration and attacked Gallicanism. In 1820 the author went to Rome, and is said to have been offered a cardinalate by Leo XII. He continued to produce works of an ultramontane character till the revolution of 1830, when a change in his views began to be apparent. He joined Lacordaire and Montalembert in conducting *L'Avenir*, a journal devoted to the cause of religious and political freedom, having for its motto "*Dieu et Liberté*." Their views were condemned by Pope Gregory XVI., and in 1834 Lamennais announced his change of attitude towards the Papacy in his *Paroles d'un Croyant*. Its author now gradually became a free-thinker, and an active sympathiser with revolutionary ideas. In 1840 he was condemned to a year's imprisonment for a political pamphlet, and he was a member of the Constituent Assembly in 1848. In these later years he produced *Esquisses d'une Philosophie* and a translation of the *Divina Commedia*. His *Affaires de Rome*, published in 1837, and condemned by the Pope, gives an account of his journey to Rome in 1824 to defend his *Essais sur l'Indifférence*, which had offended even the orthodox.

Lamentations, the name of a canonical book of the Old Testament, afterwards extended into the "Lamentations of Jeremiah," but now always used in the earlier and shorter form. The tradition that the book was written by Jeremiah is probably due to a note which precedes the Septuagint version;

it is not supported by internal evidence. Each of the first four dirges begins by describing the piteous state of Jerusalem, but finally expresses the writer's confidence that Jehovah will avenge the injuries inflicted on His people. The fifth and closing dirge on the other hand, is a prayer entreating Jehovah to lay aside His long-continued wrath.

Lametrie, JULIEN OFFRAY DE (1709–54), a French materialist writer, was born at St. Malo. His father intended him for the Church, but he himself preferred medicine. As surgeon of the Gardes Françaises he was present at Dettingen and Fontenoy. In 1746 he produced his *L'Histoire Naturelle de l'Âme*, which he pretended was a translation from an English work. The way in which it was received compelled him to take refuge at Leyden, which he had to leave two years later in consequence of his *L'Homme Machine* and several satires on the medical faculty. He passed his last years at Berlin under the protection of Frederick the Great.

Lamia. [DEMONOLOGY.]

Lamination, the division of a rock into thin leaf-like layers, or *laminae*, having the same mineral composition and parallel, to the stratification. The structure is characteristic of shale, and, as most of the clayey rocks of great geological age are shaley, it may be in these cases due to the vertical pressure of superincumbent rocks. [CLEAVAGE, FOLIATION SHALE.]

Lammas Day, August 1st, the feast of St. Peter ad Vincula ("in chains"). The name (Anglo-Saxon, "loaf-mass") was probably given because the bread used at the mass was made of the new corn.

Lämmergeier, the German name of the Bearded Eagle, Vulture, or Griffin (*Gypaëtus barbatus*), the *Quebranta-huesos*, or Bone-smasher of the Spaniards, the largest bird of prey in the Old World. This eagle, with the habits of a vulture, ranges from the south-east of Europe and the north of Africa eastward to China. The length is from three to four feet, and the wing-spread from nine to ten feet. The plumage on the upper surface is brownish black, tawny beneath; the white head bears a black line on each side, and there is a tuft of black bristles at the base of the bill. It is a cowardly bird, feeding on small mammals and carrion; and stories, apparently well authenticated, are told of its carrying off young children.

Lamoricière, CHRISTOPHER LOUIS LÉON JUHAULT DE (1806–65), French general, was a native of Nantes. Having entered the army in 1826, he served for many years in Algeria, and was largely instrumental in the capture of Abd-el-Kader in 1847. He had been elected a deputy of the French Assembly in the preceding year as a member of the constitutional opposition; and on the abdication of Louis Philippe he wished to proclaim the Duchess of Orleans regent. He did good service against the insurgents, and was made war-minister by Cavaignac. As an opponent of Louis Napoleon he was arrested on the night before the *coup d'état* of 1851, and was banished from France. In 1860 Pius IX. made him commander of the Papal troops, but he

was defeated by the Sardinians, and capitulated at Ancona on September 29th. He died at Amiens.

Lamp is a term somewhat loosely applied to various devices for artificially producing light or heat, but is more properly confined to those in which fluid fuel is burnt. A lamp consists essentially of a reservoir to contain the oil or spirit, a wick and wick-holder, and some means for ensuring an adequate supply of air to the flame. The lamp of the ancients was merely a shallow vessel, with a spout holding a solid round wick of fibrous material. This construction is retained in the case of spirit-lamps, but the supply of air is not sufficient for the complete burning of oil. An improvement was effected by the substitution of a flat for a round wick, as the flame was spread out and exposed more surface to the air. This flat wick was bent into a tube by Argand, who effected a further improvement by adding a chimney, which caused a current of air to impinge on the flame. This chimney was then contracted near the base of the flame, and a metal disc placed inside the flame, both of which deflected the air against it. Modern lamps have merely been improved in points of detail. Mineral oils (paraffin) are sufficiently limpid to rise in the wick by capillary attraction, but in the case of thick oils, such as colza, which were used until comparatively recently, some means must be provided to force the liquid up to the burner. The "Moderator" is the best of these: a piston, propelled by a spring, forces the oil upwards. In the "reading-lamp" the burner is about on a level with the bottom of the reservoir, the oil from which flows into the burner by gravity. Paraffin has practically superseded all other oils for burning. The cheaper forms of lamp have one flat wick, which, as in the case of almost all lamps, can be raised or lowered in a tube by means of toothed-wheels fitted on a spindle. A sheet-metal cap covers the wick-holder, and has an oval slit to direct the air-current against the flame. Better distribution of light is effected by having two wicks, as in duplex-lamps, and three or more wicks are used in lamps for optical lanterns. Several forms of tubular burners have been devised for paraffin-lamps, in some of which the air is supplied to the inner portion of the flame by a tube passing through the centre of the oil-container. The chief points to be considered in the design of a lamp are: the chimney must be long enough to produce a strong current of air, which must be directed against the flame by a contraction of the chimney, or by properly-placed pieces of sheet-metal; the oil-holder must be as far as possible prevented from becoming heated by arranging that the air shall circulate round those parts which would conduct the heat downwards from the flame. Blow-lamps produce a non-luminous flame of great heat by combustion of the vapour produced by heating alcohol or benzolene. This is allowed to escape through a fine jet, and in the best forms burns in a Bunsen burner.

Lampblack consists almost entirely of amorphous carbon in an extremely fine state of division. It is formed by burning an oil, or other highly carbonaceous material, in a limited supply of air, and

collecting the soot formed as a product of the incomplete combustion. It is very largely used as a pigment, and in the manufacture of printing and Indian inks.

Lamprey, the popular name for any vertebrate of the Cyclostome family Petromyzontidæ. [CYCLOSTOMATA, HAG.] The body is eel-shaped and naked, the skeleton cartilaginous, and there is a single nostril on the upper side of the head, and behind the head on each side are seven branchial pouches. The larvæ undergo a metamorphosis. Lampreys are widely distributed in the rivers and round the coasts of the north and south temperate zones. Little is known of their habits, but some ascend rivers to spawn, and in fresh water the young undergo their metamorphosis, which takes from three to four years to complete. They feed on dead aquatic animals, thus acting as scavengers, and on crustaceans, and attach themselves to fish by means of their suctorial mouth, eating into the flesh of their victims, who are unable to shake off their enemies. Dr. Günther records the fact that salmon have been taken in the Rhine with the Sea Lamprey attached to them. The type-genus *Petromyzon*, from the northern hemisphere, has two dorsal fins, the hinder one continuous with the caudal. There are three British species—the Sea Lamprey (*P. marinus*), about 3 feet long, from the coasts of Europe and North America; the River Lamprey (*P. fluviatilis*), about 2 feet long; and Lampern, Pride, or Sandpiper (*P. branchialis*), about half that size. The larva of the last-named form was long thought to be quite distinct, and was formerly placed in a separate genus. [AMMOCETE.] Its toothless mouth is fringed with barbules, the small eyes are hidden in a groove, and there is a single continuous vertical fin. Lampreys have long been esteemed for food, and G. A. Sala states that a large number of the "eel-pies" sold in London are made from Thames Lamperns.

Lampyrine. [GLOWWORMS.]

Lamuts, a branch of the Tungus people who occupy the banks of the Kolyma, the shores of the Sea of Okhotsk from the station of Okhotsk to Ghizighinsk Bay, and the west coast of Kamchatka. The Lamuts, who are reindeer nomads, are readily distinguished from the other Tunguses both by their ruder dialect and coarser features, more oblique eyes, more prominent cheek-bones, and extraordinarily small nose. Their camping-grounds are chiefly along the coast, whence their name from the Tungus word *lam* = "sea"; total population, a little over 3,000.

Lanarkshire, a lowland county of Scotland, having Stirling in the N., Dumfries on the S., the Lothians and Peebles on the E., and Renfrew and Ayr on the W. It has an area of 564,284 acres. The river Clyde cuts it into two nearly equal portions, and the Avon and other tributaries help to water it. In the S. are the Lowther or Lead Hills, from which the Clyde rises. Much of the soil is barren marshland, but the rest affords excellent pasturage, and from it abundant fruit crops are raised. The Clydesdale orchards have been famous

for centuries. Lanarkshire is rich in mineral products, coal, iron, and lead being obtained in great abundance. Some gold and silver is found. The chief towns are Glasgow, Airdrie, Hamilton, and Lanark, the last being an old place 31 miles S.E. of Glasgow, near which are the beautiful falls of Clyde. Lanark, Hamilton, and Airdrie are members of the parliamentary group of Falkirk boroughs. The county was given four new members by the Reform Bill of 1885, and has six in all. Pop. (1901), 1,339,327.

Lancashire, the most populous county in England, though only the sixth in size, lies mainly between Yorkshire and the Irish Sea, but has Westmoreland on the N.E. and Cumberland on the N. A small part of it, called Furness, is separated from the rest by Westmoreland and Morecambe Bay. Lancashire is 76 miles long, and has a total area of 1,208,154 acres. The coast-line is much indented, Morecambe Bay and the mouths of the Ribble and Mersey being the largest inlets. The county is mountainous in the north and along a great part of the Yorkshire border. Conistone Old Man, near the Cumberland border, is 2,633 feet high. The Lune, the Mersey, and the Ribble are the chief rivers, with the Leven in Furness. The climate is mild, and the rainfall somewhat heavy. Oats and potatoes and some wheat are grown; but Lancashire is not an agricultural county; it has a large coalfield; and limestone, iron, lead, and other minerals are found. The chief industries are the cotton manufacture, the making of machinery, and shipbuilding. The most important towns are Liverpool, Manchester, Preston, Blackburn, Salford, Bolton, Wigan, Burnley, Bury, and Barrow-in-Furness. Lancaster is the old assize town. Lancashire returns twenty-three county members by the Reform Bill of 1885. Pop. (1901), 4,437,398.

Lancaster. 1. The county town of Lancashire, stands on the S. bank of the river Lune, 20 miles N. of Preston. The old castle is now used as the county goal and assize courts. The church of St. Mary dates from the 15th century, and contains some fine stained glass. In 1698 the town was almost destroyed by fire. Among its modern institutions are the Ripley Hospital for orphans and the Royal Albert Asylum for Idiots and Imbeciles. There is a dock at Glasson, five miles distant. Whewell and Richard Owen were natives of the town. Pop. (1901), 40,239.

2. A county capital in Pennsylvania, 69 miles W. of Philadelphia, was founded in 1730, and was for some years the capital of the state. It has large tobacco warehouses, and numerous cotton mills, breweries, and tanneries. Among educational establishments are the Franklin and Marshal College and a theological college for members of the German Reformed Church.

Lancaster, DUCHY AND COUNTY PALATINE OF. The ancient honour of Lancaster was by Henry III. made into an earldom and given to his son Edmund. Edmund's grandson Henry was created a duke and earl palatine by Edward III. in 1351. In 1377 these titles passed to John of Gaunt, who had married Henry's daughter and heiress, and were by him handed on to his son,

Henry IV. After the attainder of Henry VI. the duchy was united to the Crown by Act of Parliament, the county palatine being incorporated in the duchy at the same time. This arrangement has been maintained up to the present time. The revenues of the duchy have always formed a distinct item in the royal revenue; they are paid over to the Privy Purse, and an annual account is presented to Parliament, but in other respects they are free from parliamentary control. The administration of justice was assimilated to that of the rest of England in 1873, and the office of Chancellor of the Duchy is now a political appointment with nominal duties, frequently held by a Cabinet Minister.

Lancaster, JOSEPH. [EDUCATION.]

Lancaster Gun, an obsolete heavy gun, the peculiarity of which consisted in the fact that the twist to the projectile was given, not by rifling, but by making the bore of the gun of oval instead of circular section.

Lance, a long spear, used for charging rather than throwing. It was much used in the Middle Ages, when it exceeded in length the modern lance by about five feet.

Lance, GEORGE (1802-64), the still-life painter, was a native of Little Easton, Essex. He was a pupil of Haydon for seven years, and exhibited between 1828 and 1862 both at the Royal Academy and the British Institution. He died at Sunnyside, near Birkenhead. Three of his pictures, two of which are fruit pieces, are in the National Gallery, and two fruit pieces and a portrait of himself (1830) at South Kensington.

Lanceolate, shaped like a little lance, a term applied to the form of leaves, in slightly differing senses by various writers. Some define it as narrowly elliptical, tapering to each end—widest, that is, across the middle. Others consider it more typically represented by a narrow leaf widest near the base and tapering upwards. Both forms occur in many willows.

Lancers, cavalry soldiers armed with lances. They were introduced into European armies by Napoleon I.

Lancewood, straight-grained, tough, light, and elastic wood used for straight carriage-shafts, bows, billiard-cues, fishing-rods, etc. It is imported from Jamaica and other West Indian islands and from Guiana, in taper poles 15 to 20 feet long and from 6 to 8 inches across at the butt-end. Jamaica exports about 8,000 poles annually, the value of which is about £2,820. Lancewood is the produce of several species belonging to the order *Anonacea*, the custard-apple family, including *Uvaria lanceolata* in Jamaica and *Duguetia quitarensis* and *Guatteria virgata* in Guiana.

Lander, RICHARD (1804-34), an African explorer, was the son of a Truro innkeeper. In 1823 he went to the Cape of Good Hope as servant to Major Colebrook, and two years later joined Captain Clapperton's expedition to the Niger, of which he became leader on the death of Clapperton in 1827. Of this expedition he wrote an account. In 1829

he and his brother JOHN (1807-39) were sent by the Government to trace the river Niger. In 1831 they published results, giving some particulars of its lower course, and showing that it fell into the Gulf of Guinea. In the following year they also published their journal, and Richard started on a fresh expedition, the object of which was to open a Niger trade route. Having accomplished something, he received a mortal wound in a conflict with the natives.

Landes, a maritime department in the south-west of France, between the Garonne and the Pyrenees, having an area of 3,598 square miles. Its name is derived from the heaths which cover the greater part of its surface, but which extend also into the department of Gironde. Along the coast are lagoons, which communicate with the sea, intersected by sandy downs covered with pine-trees. The department is watered by the Adour and other rivers. It is thickly-populated, although much progress has been made since the 18th century in the reclamation of the soil. Sheep and pigs are kept, and much timber is cut from the extensive forests; while in the south the vine, rye, and maize are grown. There are also iron- and coal-mines. The department is divided into the *arrondissements* of Mont de Marsan (including the capital of the same name), Sever, and Dax, where there are mineral springs.

Landlord and Tenant. The relationship existing between the owner of a house or land and the person occupying the same in consideration of a certain rent, presents some points of interest. When not created by lease or by agreement varying the ordinary terms of a yearly tenancy, six months' notice to quit, expiring with date of the commencement of the tenancy, is required on either side to determine the contract. The landlord has the right of distress for recovery of his rent. The landlord impliedly ensures his tenants quiet possession and guarantees him against eviction by any person having a title paramount to that of the landlord. The rent may be received quarterly, monthly, or weekly. It is in all cases desirable for both parties to have a written agreement, though this is very much neglected, especially with small property. Where the tenant does not take upon himself the liability for repairs they have to be done by the landlord, and in cases of small tenements let by the month or week, the rates and taxes are usually paid by the landlord. There is no suspension of the liability to rent in case of fire, in the absence of any special agreement to that effect.

Landon, LETITIA ELIZABETH (1802-38), the well-known "L. E. L.," was born in Chelsea. In 1815, when living at Brompton, she made the acquaintance of Sir W. Jerdan, the editor of the *Literary Gazette*, and became a frequent contributor of verse and reviews to that paper. Her verse soon became popular. *The Troubadour* and other poems appeared in 1825, and her first novel, *Romance and Reality*, in 1831. Her best work of fiction was *Ethel Churchill* (1837). *Traits and Trials of Early Life* was probably autobiographical. She married, in 1838, George Maclean, Governor of

Cape Coast Castle. Soon after her arrival in Africa she died, probably by her own hand.

Landor, WALTER SAVAGE (1775-1864), was born at Warwick. He distinguished himself at Rugby by his skill in writing Latin verse, but had to be removed for his intractable conduct. He showed the same qualities and defects at Oxford, and was rusticated by the authorities of Trinity College. He quarrelled also with his father and with his wife, whom he married immediately after meeting her at a ball in Bath. He adopted no profession, but lived on an allowance during his father's life. In 1798 he published *Gebir*, which was admired by Southey, Coleridge, and Shelley, but was little read. On the death of his father in 1805 Landor went to live at Bath. In 1808 he made the acquaintance of Southey, who became his life-long friend and warmest admirer. In the same year he served for some months in Spain against the French, and on his return joined in the denunciation of the Convention of Cintra. *Count Julian* was composed in the winter of 1810-11, and published by the help of Southey. The next few years were spent at Llanthony Priory, a place Landor had bought in Wales. Here he was unfortunate, and in 1814 had to go to Jersey. After a short time in France he went to live in Italy. In 1835, after another quarrel with his wife, he again came to England, where he remained till 1858, when he was driven away by an unpleasant libel action, in which heavy damages were given against him. He was now entirely dependent upon his family, and, after lingering for six years longer, died at Florence. His greatest work was undoubtedly in prose, *The Imaginary Conversations*, *Pericles and Aspasia*, and *The Pentameron*.

Landrail. [CORNCRAKE.]

Landseer, SIR EDWIN HENRY (1802-73), the great animal-painter, was born in London. He made sketches of animals before he was six years old, and also etched at an early age. In his twelfth year he gained the silver medal of the Society of Arts. In 1816 he entered the Royal Academy schools, and next year exhibited a portrait of a terrier. In 1820 he gained his first great success with his *Alpine Mastiffs reanimating a Dead Traveller*. In 1826 he was elected A.R.A., and in the following year exhibited his first great Highland picture. In 1831 he became an Academician, and in the same year exhibited at the British Institution his *High Life* and *Low Life*, now in the National Gallery. Between 1830 and 1840 were also painted his most popular dog-pictures, *Jack in Office*, *Old Shepherd's Chief Mourner*, *A Distinguished Member of the Humane Society*, and *Laying down the Law*. In 1850 he was knighted, in 1855 received the gold medal at the Paris Exhibition, and in 1859 began the lions in Trafalgar Square. He refused the presidency of the Royal Academy in 1865. For many years he suffered from great mental depression, and in 1868 was hurt in a railway accident. He was buried in St. Paul's.

Landslips, the detachment and slipping forward of masses of rock from the upper part of steep

slopes or cliffs. They may originate in the opening of an earthquake fissure, in the undermining of its bank by a river, or in the solution of beds of rock-salt by underground water; but the most general cause is the saturation of rock by exceptional rain aided in many cases by the inclination of the strata. The fatal landslip at Naini-Tal, in the Himalayas, was due to the slipping of a saturated mass of highly-inclined slates. Very frequently an underlying sandy layer is converted by the water into a running sand, whilst a bed of clay may be so lubricated as to facilitate the slipping under the influence of gravitation. Such a sandy layer underlay the highly-inclined sandstones and conglomerates in the Rossberg landslips of Goldau in 1806 and 1874, and the prehistoric slip which produced the Under-cliff of the Isle of Wight, and that of 1839 near Axmouth, were caused by water-laden Cretaceous rocks over a layer of porous Greensand and a mass of Gault or Lias clays. From its frequent action in this manner the Gault is known as the "blue slipper clay."

Landuman (LADUMA), a Negro people of Senegambia, Rio Nunez basin, nearly to the coast, from which they are separated by the Nalu and Baga tribes; formerly under the Fulah prince of Futa-Jallon, the Landumans are now French subjects, governed from the station of Boké, which has replaced the old post of Kakandy. They are fetishists of a low type, observing many gross and even atrocious rites; indolent and given to drink and revolting orgies; practising no arts except agriculture (rice, millet, ground-nuts); speech closely akin to that of the Jalonkes, which is a Mandingan dialect.

Landwehr ("LAND DEFENCE"), a corps in the armies of Germany and Austria, the members of which are liable to military service only in time of war. The Prussian Landwehr was originally organised by Scharnhorst in 1813. At present every German serves in the Landwehr for five years after completing his term of regular military service.

Lane, EDWARD WILLIAM (1801-76), the Arabic scholar, was born at Hereford, and educated there and at Bath. He learnt engraving under Charles Heath, but had to go abroad for his health. In 1825 he first went to Egypt, and next year ascended the Nile as far as the second cataract. In 1827 he went to Wady Halfa, and spent several days at Thebes. In the intervals of his travels he lived at Cairo, studying the language and people, whose dress he always wore. On his return to England in 1828 he brought with him in MS. his *Description of Egypt*, illustrated by more than 100 sepia drawings. It was enlarged after another visit to Egypt in 1833-35, and published in 1836 by Charles Knight under the title *Account of the Manners and Customs of the Modern Egyptians*. The work has been translated into German, and is still a standard authority. Between 1838 and 1840 Lane's translation of the *Arabian Nights* appeared in monthly parts. The notes to it were republished in 1883 under the title of *Arabian Society in the Middle Ages*. In 1842 Lane visited Egypt for the third

time, and remained there for seven years, during which he worked from twelve to fourteen hours a day at the composition of his *Arabian Lexicon*. Five volumes of it were published before his death, and it was completed in 1892 by S. Lane-Poole.

Lanfranc (d. 1089), Archbishop of Canterbury and chief minister of William the Conqueror, was born about 1005 at Pavia. He was well educated, and as a youth distinguished himself as a pleader in the courts. Preferring to devote himself to learning, he went to France, and set up a famous school at Avranches, in Normandy, in 1039. After some years he determined to become a monk, and entered the newly-founded monastery of Bec, of which he became Prior. Here he had Anselm and the future Pope Alexander II. among his scholars. He soon gained the favour and confidence of Duke William, whose marriage he at first opposed but afterwards advocated at Rome in person. In 1066 he left Bec for Caen. William consulted him about the invasion of England, and offered him in 1067 the archiepiscopal see of Rouen. In 1070 he accepted with some reluctance the Primacy of England, and next year received the pallium from his former pupil. Lanfranc worked in complete harmony with William I. He had a great contempt for the English, and always promoted the appointment of foreigners to sees and benefices. The part he played in obtaining the crown for William II. was important, and he stood by the new king against his old enemy Odo. Before his death, however, he lost much of his influence over Rufus. [WILLIAM I.]

Lanfrey, PIERRE (1828-77), French historian, was born at Chambéry. He studied law, but preferred literary work to practice. In 1858 he published an essay on the French Revolution, and in 1863 *Études et Portraits Politiques*, containing essays on Proudhon and Thiers' *History of the Consulate and Empire*. The first volume of his epoch-making *Histoire de Napoléon I^{er}* appeared in 1867, and the fifth in 1875, but the author only lived to carry it to the beginning of 1812. He served in the army during the German War, and, having afterwards entered the Assembly, was made by Thiers ambassador to Berlin in 1873. In 1875 he became senator. [NAPOLEON.]

Lang, ANDREW, critic and man of letters, was born in 1844. He was educated at St. Andrews and Balliol College, Oxford, and was elected a fellow of Merton in 1868. Besides doing an immense amount of journalistic work, he has devoted himself especially to scientific mythology, anthropology, and folk-lore. He has translated with Professor Butcher the *Odyssey* of Homer, and, with Messrs. Leaf and Myers, the *Iliad*; and has by himself produced fine renderings of Theocritus, of Perrault's *Fairy Tales*, and of *Aucassin et Nicolette*. He has also written several volumes of delicate original verse.

Langland, or LANGLEY, WILLIAM, the supposed author of *The Vision of Piers Plowman*, lived some time in the 14th century. Almost all that is known about him is in the notes to the MSS. of that work. Bale, a 16th-century writer, says he was a priest who was born at Cleobury Mortimer, in

Shropshire, that he was one of the first followers of Wycliff, and that his work was finished in 1369. Stow calls him John of Malvern, and there are references to the Malvern Hills in his work. We know from himself that he made his living by singing psalms and canticles, and that he spent most of his life in London, which he seems to have known well. Forty-five MSS. of *Piers Plowman* are in existence.

Langton, STEPHEN (d. 1228), a great English prelate and statesman, was born towards the end of the 12th century. He graduated in arts and theology in Paris, where he lived till 1206. In that year he was summoned to Rome by Innocent II. and created a cardinal. In the same year, when he was at the height of his reputation as a scholar, he was elected Archbishop of Canterbury, after two uncanonical elections had been quashed by the Pope. He was consecrated at Viterbo in 1207, but King John refused to acknowledge him, and proclaimed as his enemies all who should do so. The Pope in 1208 placed England under an interdict, and it was not till after a five years' struggle that Langton was allowed to act as Primate. During this time he lived chiefly at Pontigny, but in 1212 went to Rome to urge Innocent to take decisive steps to remedy the misery which existed in England. On his arrival in England Langton immediately took up a constitutional position. He mediated between John and the barons who refused to follow him to Poitou, and opposed the king and the legate when they appointed to vacant sees according to royal pleasure. In the eventful year 1215 he played an important part. He became one of John's sureties for the fulfilment of the charter of Henry I., mediated between the king and the barons when John's promises were not carried out, and brought to the king the articles afterwards embodied in the Great Charter. After the acceptance of the charter the Pope turned against the constitutionalists, and Langton went to Rome to remonstrate against their excommunication. He was suspended from his functions till the death of Innocent and the accession of Henry III. in England. In 1218 he returned to England, crowned the new king, and obtained from Honorius III. the promise that no Papal legate should come to England during his (Langton's) lifetime. In 1222 he presided over a very important Church council at Osney. His remaining years were occupied in obtaining confirmations of the charter from Henry III. and in securing the allegiance of the anarchical party among the barons.

Language. [PHILOLOGY.]

Languedoc, the name of an old French province, which is now divided into the departments of Aude, Tarn, Hérault, Lozère, Ardèche, and Gard, with several *arrondissements* in Haute-Garonne and Haute-Loire. Under the Romans it was known as *Narbonensis Prima*. It was granted by Honorius to the Goths, from whom it passed to the Saracens, till they were expelled by Charles Martel in 725. After belonging successively to the Counts of Toulouse and Philip the Bold of Burgundy, it became part of France in 1361. It was the land

of the troubadours and the Albigenses. *Langue d'oo* is the southern French dialect, as opposed to *langue d'oïl*, that of the north.

Laniidæ. [SHRIKE.]

Lanner. [FALCON.]

Lannes, JEAN, DUC DE MONTEBELLO (1769–1809), Napoleon's favourite marshal, was born at Lectoure. He entered the army in 1792, attached himself to Bonaparte in 1795, and greatly distinguished himself in his Italian campaigns. He also accompanied him to Egypt, and was with him at Marengo. From 1801 to 1804 Lannes was ambassador at Lisbon, after which he received a marshal's bâton and was ennobled. He afterwards served with distinction at Austerlitz, in the Prussian campaign, and in Spain, and was mortally wounded at Essling in the second Austrian War.

Lanoline. [CHOLESTERIN.]

Lansdowne [First Marquis, *see* SHELburne, EARL OF LANSDOWNE], **HENRY PETTY FITZMAURICE** (1780–1863), third Marquis, was born in London. He entered Parliament as a Whig in 1802, and soon made his mark by his speech against Lord Melville's naval administration. In 1806 he (Henry Petty) was returned for Cambridge University, but in 1809 became a peer by the death of his elder brother. He was Chancellor of the Exchequer in Lord Grenville's Ministry, and in 1826 became Home Secretary under Canning. In the Goderich Ministry he was Foreign Secretary, and from 1831 till 1841 was President of the Council in Grey's Reform Ministry. After leading the Opposition to Peel's first Government in the House of Lords, he, in 1846, became Lord President under Lord John Russell. In 1852 he declined to become Prime Minister, but was a Cabinet Minister without portfolio in the Coalition Ministry and in the first Palmerston Administration.

Lansdowne, HENRY CHARLES PETTY FITZMAURICE, fifth Marquis, eldest son of the fourth Marquis, was born in 1845. He was a Lord of the Treasury in Mr. Gladstone's first Ministry till 1872, when he became Under-Secretary for War. In 1880 he was appointed Under-Secretary for India, but resigned almost immediately because of his objection to the Liberal Irish policy. From 1883 to 1888 he was Governor-General of Canada, and was offered a seat in Lord Salisbury's second Cabinet. From 1888 to 1893 he was Governor-General of India. From 1895–1900 he was Secretary of State for War, and from 1900–1905 Secretary for Foreign Affairs.

Lantern Flies, a number of species of the genus *Fulgora*, including some of the largest of the Homoptera (q.v.). Some of the largest South American species are 3 inches long, but these are probably not luminous.

Lanthanum (La)—atomic weight, 139—is a rare metallic element which occurs in *cerite* (q.v.) and some other rare allied minerals. The metal, which was discovered by Mosander in 1839, has a steel-grey colour, and oxidises if exposed to moist air. It possesses moderate ductility and malleability. It forms salts corresponding to the *oxide*.

La_2O_3 , which is a white powder somewhat resembling lime.

Lanzarote, the most northerly of the Canary Islands (q.v.). It produces the finest wines; the capital is Arrecifa.

Lao, a main branch of the Tai race [TAI], closely related to the Siamese, but largely intermixed with Indo-Chinese aborigines, hence presenting a great diversity of types, are variously divided: first, into three groups—white, who do not tattoo; black and green, who paint the face in these colours; second, into white and black Paunches (Lau-pang-kah and Lau-pang-dun), the former in East Siam between Mount Deng-Phya-Phai and River Mekhong, the latter on River Menam above Bangkok, and thence to the Burmese frontier. These western Laotians are the same people as those collectively known as Shans, and ethnically the Lao, Shan, and Siamese are essentially one people, closely-related branches of the widespread Tai family. The Lao language is scarcely to be distinguished from the Siamese, except by its slower accentuation; it is little cultivated, and the writing system said to be peculiar to the Laotians is merely a modified form of the Cambodian, which is derived from the Pali introduced into Indo-China by the Buddhist missionaries from India. All the settled Laotians have long been Buddhists, governed by Siam either directly or through vassal native princes; but many have become French subjects since 1893, in which year the Laos territory was taken from Siam and became a French protectorate. The so-called Lavas (Lawa, Lova) are pure or mixed Lao peoples, who have remained unaffected by Buddhist influences, and who are often scarcely to be distinguished from the surrounding wild tribes (Khas). They are, in fact, regarded as such by the civilised communities, who raid them periodically to keep up their supply of slaves, domestic slavery being still a universal institution amongst the Laotians. The Lao and Shan states and provinces have an area of not less than 160,000 square miles, with a total population vaguely estimated at from two to three millions.

Laocoön, according to the Greek legend, a brother of Anchises and a priest of Apollo. Having offended the god by his marriage, and also, perhaps, by the warning he gave to the Trojans about the wooden horse, he was destroyed with his two sons by two serpents while sacrificing to Poseidon. Virgil tells the story in the second book of the *Aeneid*, and it has been preserved for posterity by the splendid sculpture now in the Vatican.

Laodicea (ΛΑΟΔΙΚΕΙΑ), the name of eight cities, so called by Seleucus, King of Syria, and his descendants from Laodicea, a frequent female name. Laodicea ad Lycum, in Phrygia, founded probably in the 3rd century B.C. by Antiochus II., and named after his wife, is one of the seven churches in the Revelation. Its site, now known as Eski Hissar, is deserted. It was a rich city, famous for its great medical school, for the wool which came from the sheep which were pastured in the neighbourhood, for its money transactions, and later for its coinage. Its ruin came when the Turks

invaded the Byzantine Empire. Two ecclesiastical councils (those of 363 and 476) were held here.

Laon, capital of the department of the Aisne, is 87 miles N.E. of Paris. It is rich in historical memories, the hills round it having been the scene of battles from the days of Julius Cæsar to those of Napoleon, who in 1814 tried in vain to dislodge Blücher from them. In September, 1870, a powder magazine was exploded at the moment when the Germans were taking possession. The see of Laon was founded by St. Remigius, and remained till the French Revolution. The first cathedral was destroyed in the communal disturbances of the 12th century, but was then replaced by a splendid building, part of which exists to the present day. Laon was one of the chief cities of the Franks, and in its fine library is an autograph of Lothair dated 972. The modern town is small and of little importance.

Lão-tsze, the reputed author of the *Táo Teh King*, one of the sacred books of China, lived probably in the 7th century before Christ, and was a historiographer in the state of Ch'ü, where is the modern province of Ho-nan. He was a contemporary of Confucius, whom he is thought to have met in 517 B.C. His real name was Li Erh, the designation by which he is generally known, meaning probably "the Venerable Philosopher." After writing his book at the request of Yin Hsi, the keeper of the gate leading into territories beyond those of Chán, he went away, and Ch'ien does not know when or where he died. The *Táo Teh King* is a short treatise, divided at first into two parts, but now subdivided into chapters. It seems that the quality which is inculcated in the book is single-minded action. The people were to be kept by their rulers without knowledge, so that they would wish to live only the life of the utmost simplicity. Táo "might appear to have been before God," says Láo-tsze. Humility, gentleness, and economy are its "three precious possessions," and good is to be returned for evil. Taoism at present is a system of polytheism, which borrowed from Buddhism its temples, liturgies, and forms of worship.

La Paz, the name of a department of Bolivia and its capital. The department, which joins Peru, has an area of 43,000 square miles, and contains the highest mountain of the Bolivian Andes. The town of La Paz de Ayacucho is one of the highest situated in the world, standing 11,970 feet above the sea-level. It is 40 miles E. of Lake Titicaca. Founded in 1548, it became a bishopric in 1605, in which year its cathedral, one of the finest in South America, was begun. A trade in copper and cinchona is carried on by its Indian and half-breed inhabitants. There is also a town called La Paz in the province of Entre Rios, Argentina.

Lapis Lazuli, a beautiful blue mineral consisting of a silicate of alumina, lime, and soda, with sulphides of iron and sodium. It usually occurs massive with an uneven fracture; but sometimes has dodecahedral cleavage or more rarely distinct crystalline form, belonging to the Cubic system. It is nearly opaque, with a vitreous lustre, a hardness

between 5 and 5.5, so that it takes a polish, and a density of about 2.4. With hydrochloric acid it forms a jelly of silica, and gives off sulphuretted hydrogen. It fuses, with intumescence, into a white glass. Veins of iron pyrites often occur in it, and ancient writers speak of it as the "sapphire sprinkled with gold." It occurs in crystalline limestone or gneiss in Persia, near Lake Baikal, in the Andes, and elsewhere, and was used for ornamental purposes in ancient Assyria and Egypt. It was long the sole source of the costly pigment *ultramarine*, for the preparation of which the lapis was ground, calcined, and levigated with water. Smalt-blue was often used instead of ultramarine; but now an artificial ultramarine, as good as the real, is prepared from clay, carbonate of soda, and sulphur at less than one-fiftieth of the cost.

Laplace, PIERRE SIMON, MARQUIS DE (1749–1827), the Newton of France, was a native of Beaumont-en-Auges, in Normandy. His abilities gained him the help of some neighbours of position, and at the age of eighteen he went to Paris with letters of introduction to D'Alembert. A letter to the *philosophe* on the principles of mechanics gained for Laplace his life-long support. The immediate result was an appointment as professor of mathematics at the École Militaire. In 1773 he read a paper before the Académie des Sciences, of which he became a full member in 1785, in which he demonstrated the invariability of planetary mean motions. He continued to investigate the subject, upon which also Lagrange was engaged, during the succeeding years, and in 1787 communicated to the Académie in two theorems his discovery of the cause of the inequalities of Jupiter and Saturn, and in relation to the former the "laws of Laplace." In the same year he showed the dependence of lunar acceleration upon the secular changes in the eccentricities of the earth's orbit. The *Mécanique Céleste*, which was further supplemented, and the *Exposition du Système du Monde* (1796), a note to one of the later editions of which contained the nebular hypothesis, formed Laplace's contributions to mathematical astronomy. In the department of pure mathematics he produced a *Théorie Analytique des Probabilités* (1812–20). Bonaparte made him Minister of the Interior, but was obliged to replace him by his own brother Lucien after six weeks, as he had no business capacity. He was soon, however, made a senator, and in 1803 became Chancellor of the Senate and a Grand Officer of the Legion of Honour. Although he had been made a count by the new emperor, he voted for his deposition in 1814, and was rewarded with a marquisate by the Bourbons in 1817. Ten years later he died at Arcueil.

Lapland, the country of the Lapps, is little more than a geographical expression. It lies between the White Sea on the E., the Gulf of Bothnia on the S., and the north-western coast of Norway on the W. That part which lies in Norway is mountainous; the rest consists of level forests, intersected by lakes and marshes. There are no towns of any size, and the country as a whole is very thinly peopled. In the greater part of it the sun does not set in midsummer or rise in midwinter.

The temperature in May, the hottest month, never rises higher than 70° Fahrenheit, and during the winter is frequently 60° below zero. Inara, the largest lake, has an area of 1,147 square miles, and the southern parts of Russian Lapland are watered by the Kemi and its branches. The lakes and rivers abound in salmon and other fish, and flocks of ptarmigan, capercaillie, and other wild-fowl are found about the shores of the Gulf of Bothnia. The forests yield an immense quantity of timber, and there are highly productive iron- and copper-mines. The sea fisheries give employment to thousands.

La Plata, the capital of Buenos Ayres, a province of the Argentine Republic, is some 30 miles S. of the town of Buenos Ayres. It is quite a new town, having been founded so recently as 1882. It has many fine modern buildings, and manufactures cotton and woollen tissues. Seven miles from the city are a hospital and an asylum. Its harbour is connected with that of Ensenada by means of a canal.

La Plata, RIO DE, the name given to the combined mouths of the Uruguay and Paraná rivers. It is about 200 miles long and 140 miles wide in the broadest part. There are wide sandbanks along the southern shore, and the only good harbour is that of Monte Video on the Uruguay coast. The water is remarkable for its muddy yellow colour. The Rio de la Plata was discovered by Diaz de Solis early in the 16th century; the discoverer was captured and eaten by cannibals.

Lapps, a main division of the Baltic Finns [FINNS], who are thinly spread over all the northern parts of Norway and Sweden, and north-west Russia (Kola Peninsula). The national name is *Same*, a dialectic variety of the Finnish *Suomi*, and occurring also in the national name of the kindred *Samoyedes*. But they are called Lapps (a word of unknown origin) by the Russians and Swedes, and *Finns* by the Norwegians, whence *Finmarken*, the name of the region occupied by them in Norway. According to their pursuits they are classed as Sea Lapps (fishers), Forest Lapps (hunters and trappers), Mountain Lapps (reindeer nomads), and River Lapps (husbandmen settled on a few riverine tracts). Since the 18th century all have been Christians—Lutherans in Sweden and Norway, "orthodox Greeks" in Russia—and most of them are educated sufficiently to read and write their own language (a member of the Finnish group), although little use is made of the accomplishment. The fundamental type is distinctly Mongolic—low stature (about 5 feet), highly brachycephalous (round) head, small slightly oblique black eyes, large mouth, small nose, long glossy black hair, broad flat features, yellowish complexion. The deviations from this type are due to contact with the surrounding Aryan (Teutonic and Slav) populations. Morally the Lapps are described as indolent and even lethargic, though subject to sudden fits of rage and religious excitement, cunning, spiteful, and of extremely coarse habits. They are not dying out as is commonly supposed, and have even increased by 2,000 or 3,000 during the 19th century.

numbering at present about 26,000, of whom 16,000 are in Norway, 7,000 in Sweden, and 3,000 in Russia. The reindeer have also increased from about 100,000 head in the 17th century to over 400,000 in 1890. (E. Rae, *The Laplanders*, etc., 1875; A. H. Keane, *The Lapps*, 1885.)

Lapwing (*Vanellus vulgaris*), a common British bird, named from its habit of flapping its wings, and called Peewit, Peesweep, and in French *Dis-huit*, from its note. It belongs to the Plover family (*Charadriidae*), and ranges eastward through Europe into Asia. The total length is about a foot. The head is crested. The dark plumage of the upper surface and breast bears a metallic gloss, and the under-surface is white. Lapwings frequent marsh and moorland, feeding on worms, molluscs, and insects. The flesh is valued for the table, and the eggs are often sold for those of the plover.

Laramie, a river of North America, rises near the North Park, Colorado, runs northward through Albany County, then eastward through a county in Wyoming which is called from it, and, after a course of some 200 miles, enters the Plata at Fort Laramie. The LARAMIE PLAINS are a fertile plateau sixty miles long in Albany and Carbon counties, Wyoming. They are enclosed on all sides by high mountains, and are themselves 7,500 feet above the sea-level. They are almost treeless, and afford rich pasture. The plains are bounded on the E. and N.E. by the Laramie Mountains, the highest peak of which is about 10,000 feet in height.

Larboard, in maritime parlance, the ancient name for what is now called "port," i.e. for the left-hand side of a ship viewed from the stern forward. The term was disused in consequence of its too great similarity with "starboard," which means exactly the opposite.

Larceny. [THEFT.]

Larch (*Larix*), the name of a small genus of firs, with soft, linear, deciduous leaves, generally borne in tufts (*fasciculate*) on dwarf shoots. The anthers dehisce transversely, and the pollen-grains are very large and globose. The cones are small, erect, ovate-obtuse, the scales being woody and persistent with unthickened but irregular margins. *L. europæa*, the common larch, is a native of the Alps and Carpathians, growing at altitudes of 3,000 to 6,000 feet. It was introduced into England in 1629, and into Scotland in 1725, since which date it has been extensively planted, as its quick-growing durable timber affords a rapid return for capital. Of late, however, the ravages of the larch-canker, a fungus known as *Periza willkommii*, among our larch plantations have caused landowners to look for some species to replace it. Larch bark is used in tanning, and the tree also yields *Venice turpentine* and a sugary excretion known as *Briançon manna*. Other species are *L. pendula*, the Tamarack or Hackmatack of North America, and others confined to Oregon and Columbia, to the Cascade Mountains, to Japan, to the Kurile Islands, to Siberia and to the Eastern Himalaya respectively.

Lardner, DIONYSIUS (1793-1859), projector and editor of *Lardner's Encyclopædia*, was the

son of a Dublin solicitor. After a distinguished course at Trinity College, where he took the law degrees in 1827, he was ordained. In the year of his graduation, however, he removed to London, having been appointed to the chair of Natural Philosophy and Astronomy in London University. He then began the *Cyclopædia*, which was finished in 1849. He himself wrote the chief mathematical articles, and among the other contributors were Mackintosh, De Morgan, Thirlwall, John Forster, Tom Moore, and Sismondi. Between 1845 and 1849 he made large sums by lecturing in the United States; but from that year till his death lived in Paris. He is usually credited with the prediction that ocean steam navigation would be found impossible.

Lares, in the early religion of Rome, were spirits of ancestors buried within the family abode and worshipped by the household. *Lar* was probably an Etruscan word meaning "lord." There were other Lares, also tutelary, but of a more public character.

Laridæ. [GULL.]

Lark, any bird of the Passerine family *Alaudidæ*, with fifteen genera, containing 110 species, chiefly from Asia and Africa. The inner secondaries are considerably elongated, and about equal to the primaries; the hind claw considerably lengthened, and nearly straight, or very slightly curved, and the tarsi scutellated behind. The type-genus *Alauda*, with seventeen species, ranges over the Palearctic region, all Africa, India, and Ceylon. They are small birds, plain-coloured, or spotted and streaked, nesting on the ground, noted for their song as they rise aloft, and valued for the table. The Skylark (*A. arvensis*) is a common British bird, partially migratory, though very many remain during the winter. In the autumn great flocks come from the Continent to England, which serves in some sort as a starting-place for migration southwards. The general length is about seven inches, and of the female a little less. The plumage on the upper parts is brown of various shades; the throat and top of the breast pale wood-brown, with dark spots, and the lower parts are pale yellowish-brown, with a darker wash on the thighs and flanks. The feathers of the head, which are dark brown with a pale edging, form a crest. The skylark is a common cagebird, and its song has been celebrated by poets. *A. arborea*, the Woodlark, also British, is a much rarer bird; and *A. cristata*, the Crested Lark, and *Otocorys alpestris*, occasionally visit this country.

Larkspur (*Delphinium*), a considerable genus of ranunculaceous plants, natives of the North Temperate zone, many of which, both annuals and perennials, are cultivated in our gardens for the beauty of their flowers. They are acrid plants with erect stems, but slightly branched, palmately-cut leaves, and loose terminal racemes of flowers. There are five petaloid sepals, of which the posterior one is prolonged into the spur, which gives the popular name to the genus. The petals are reduced, two being within the spur; the stamens are indifferent;

and the carpels vary from one to five, each forming a follicle.

La Rochefoucauld, FRANÇOIS, DUC DE (1613-80), the great maxim-writer, was born in Paris, the descendant of a very old noble family. The family had large estates in Angoumois, and the father of the maxim-writer was made a Duke by Louis XIII. During the lifetime of the old Duke his son was known as Prince de Marsillac. Under this name he served in the wars, intrigued with Anne of Austria against Richelieu, and was banished to his estates for so doing, joined in the league against Gaston of Orleans, and took part in the first Fronde, in which he was badly wounded. During the second Fronde, in which he followed Condé, La Rochefoucauld was shot through the head in the battle of the Faubourg St.-Antoine (1652); and he now spent some years in retirement. In 1662 he disavowed the *Memoirs* published by the Elzevirs in his name. His *Maxims* (*Réflexions, ou Sentences et Maximes Morales*) appeared in 1665 anonymously, and their value was immediately recognised. The author returned to Court shortly before the death of Mazarin, and formed a friendship with Madame de la Fayette. His *Maxims* are both a literary and philosophical masterpiece. La Rochefoucauld's *Memoirs* have also great literary and historical value, but it was not till 1817 that anything like a genuine edition of them appeared.

Larochejacquelin. [LA VENDÉE.]

Larynx. The larynx is composed of a cartilaginous framework united together by ligaments, and contains the two vocal cords the vibration of which produces voice. The larynx is interposed between the trachea, into which it opens below,

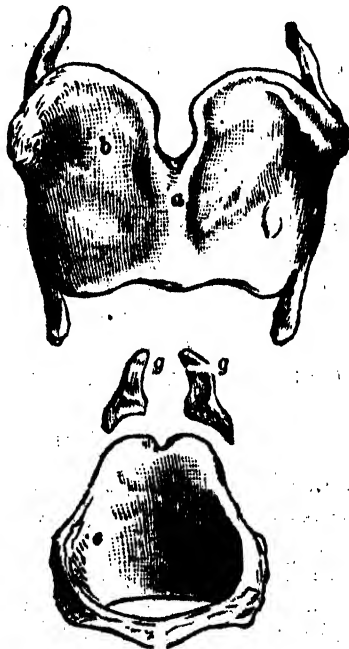


Fig. 1.—THE CARTILAGES OF THE LARYNX.

and the pharynx, into which it opens above. The superior aperture of the larynx is completely shut off from the pharynx, during the act of swallowing,

by the cartilaginous flap known as the epiglottis. The framework of the larynx is made up of the *thyroid* cartilage, which is composed of two lateral wings (see Fig. 1, *b*) uniting in front to form a prominent ridge (see Fig. 1, *a*), which is known as the *pomum Adami* or Adam's apple. Above and below on each side the thyroid cartilage has two projecting processes or horns; the two inferior processes articulate with the *cricoid* cartilage. This last named cartilage is ring-shaped, its anterior portion (see Fig. 1, *f*) being much less deep than its posterior portion (see Fig. 1, *e*). Surmounting the upper border of the posterior portion of the cricoid cartilage are the two *arytenoid* cartilages (see Fig. 1, *g*). It should be observed that the figure does not depict the cartilages in their relative positions as they lie in the larynx: the thyroid cartilage has been as it were lifted up, so as to expose the hinder portion of the cricoid and the arytenoid cartilages (Fig. 1, *e g g*). To place the cartilages in correct position it is necessary to imagine the thyroid cartilage brought down until its two lower horns articulate with the lateral portions of the cricoid cartilage. The fifth cartilage of the larynx is the epiglottis, which is inserted upon the internal or hinder aspect of the thyroid cartilage just below the notch seen in the figure at the upper margin of the cartilage. Throughout the rest of its extent the epiglottis has no attachment, and serves as a kind of valve, which when the larynx is raised in the act of deglutition folds over and closes its superior aperture, thus preventing the food from gaining access to the respiratory passages. The vocal cords are two bands of elastic cartilage, which are attached in front to the thyroid cartilage below the point of attachment of the epiglottis, and are inserted behind into the arytenoid cartilages on either side. The slit-like aperture between the margin of the cords is called the glottis. The two points of attachment of the cords to the arytenoid cartilages can be approximated or separated from one another by the action of certain little muscles which rotate the arytenoid cartilages upon the underlying cricoid cartilage. In this manner the two vocal cords can be brought into close apposition, forming a narrow slit during the production of voice, while they are withdrawn from one another forming a much wider aperture, admitting of the free passage of air when ordinary breathing is going on.

The invention of the laryngoscope has enabled an exact study to be made of the appearance of the superior aperture of the larynx. In Fig. 2, *e* is the epiglottis; *a* marks the situation of the upper portions of the arytenoid cartilages, which are surmounted by two small masses of cartilage, the situation of which is marked by *s s*; *h p h* indicate the hinder wall of the pharynx; *u s b* indicates the true vocal cord of the left side; *o s b* is an overlying fold known as the false vocal cord. Between the true and false vocal cord is a kind of pocket known as the sinus or *ventricle* of the larynx (see Fig. 2, M. V.). The tension of the vocal cords is regulated by two little muscles which connect the cricoid and thyroid cartilages, the approximation of these two cartilages putting the cords on the stretch. The manner of production of different notes is not

understood. It presumably depends upon the extent of the cords which are put into vibration. In men the vocal cords are considerably longer than in women, in correspondence with the deep note of the voice of the former as compared with the higher note of the voice of the latter.

Diseases of the Larynx. Laryngitis is inflammation of the mucous membrane which lines the

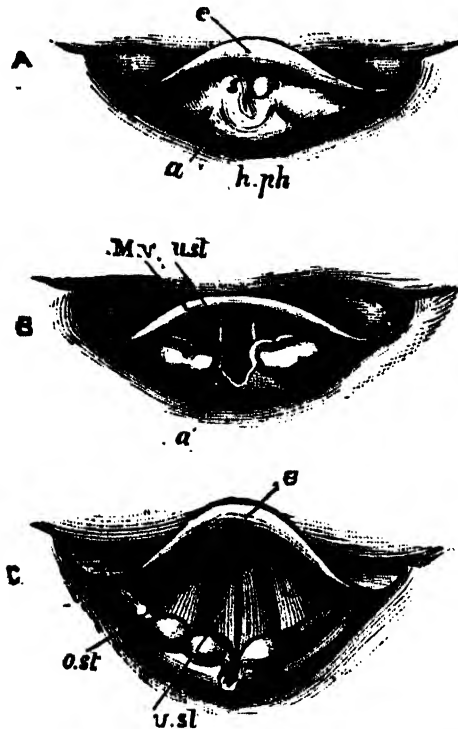


Fig. 2.—THE SUPERIOR APERTURE OF THE LARYNX.

- A. The aperture almost closed.
- B. The vocal cords separated during ordinary inspiration.
- C. The vocal cords in apposition during phonation.

Larynx. The characteristic symptom is hoarseness or loss of voice, *dysphonia* as it is called. Where there is considerable swelling, there may be obstruction to the passage of air through the larynx and difficulty in breathing, *dyspnoea*. Acute laryngitis may be due to a chill or the action of irritant substances, or may occur in the course of chronic laryngitis. The larynx in children is unhappily not infrequently attacked in the course of diphtheria, and the false membrane which is then formed leads to serious obstruction to breathing and may necessitate the performance of an operation (tracheotomy or laryngotomy). Chronic laryngitis is usually accompanied by ulceration, and there may be considerable loss of substance. It is met with as the result of excessive use of the voice, and occurs in association with phthisis, syphilis, malignant disease, etc. Paralysis of the muscles which move the vocal cords is sometimes due to pressure upon the nerve (recurrent laryngeal) which supplies such muscles.

La Salle, ROBERT CAVELIER, SIEUR DE (1643-87), a great French explorer, was born at Rouen. He went to Canada in 1666, and some years later explored the country between Ohio and the lakes. Having obtained the support of the French Government, he descended the Mississippi, and at its mouth

set up the arms of France on April 9th, 1682. He then returned to Europe, but in 1684 was given soldiers and four ships in order to attack the Spanish power in Mexico, the ostensible object being to found a trade establishment at the mouth of the Mississippi. The expedition was unsuccessful; and, after two years' wandering about the borders of Texas, La Salle set out for Canada by way of the Mississippi. He seems, however, to have made himself unpopular by his harshness, and was assassinated by his followers near Trinity river.

Lascaris, CONSTANTINE, a great Greek scholar of the 15th century, was a descendant of the Emperors of Nicæa. On the fall of Constantinople he came to Italy, and became Greek tutor to the daughter of Francesco Sforza. In 1476 his *Greek Grammar* was published at Milan; it was the first Greek book printed. Lascaris afterwards taught at Rome and Naples, but died at Messina in 1493, having Pietro Bembo among his pupils. He left a collection of valuable MSS. to the Senate of Messina. Another member of this family, JOANNES LASCARIS, who was born about 1445, and died in 1535, was commissioned by Lorenzo de' Medici to collect Greek MSS., and was afterwards invited to France, where he was employed as a diplomatist by Charles VIII., Louis XII., and Francis I., and took part in the formation of the royal library at Fontainebleau.

Las Casas, BARTOLOME DE (1474-1566), "the Apostle of the Indies," was born at Seville. He graduated at Salamanca, but before his ordination in 1510 had been with Columbus to the West Indies, and lived in Hispaniola (Hayti) for several years. In 1511 he went to Cuba, where some years later he was given a "repartimiento" or allotment with Indians attached to it. Having been touched by the sufferings of the natives, he returned to Spain and induced Cardinal Ximenes to send a commission of inquiry to Hispaniola. He returned to Spain in 1517, and elaborated a scheme the main features of which were that Indian labour should be alleviated by emigrants from Spain and by the importation of African negroes. The scheme was a failure, and Las Casas soon bitterly regretted his slavery project. From 1522 to 1530 he retired to a Dominican convent in Hayti, and devoted himself to study. In the latter year he revisited Spain, and in the succeeding years travelled and preached in Mexico, Central America, and Peru. In 1537-38 he christianised the inhabitants of Tuzulutlan, the "Land of War." Having declined the see of Cuzco, he accepted that of Chiapas, in Mexico, but, after administering it for three years, returned to Spain, disgusted by the failure of his efforts on behalf of the Indians. In 1550 he held a public disputation with Sepulveda at Valladolid, attacking with great eloquence the thesis maintained by him as to the lawfulness of carrying on unprovoked war against the Indians. His last years were crowned with success; for before his death at Madrid he had persuaded Philip II. not to approve the selling of the reversions of the "encomiendas" (by which the Indians would have been handed over to permanent

slavery), and had also obtained the restoration of the Guatemala courts of justice.

Las Cases. [NAPOLEON I.]

Laski, or **À LASCO**, JOHN (1499-1560), one of the reformers, was born in Poland. He was educated, with his brothers, by the Primate of Poland. He studied at Bologna, and in 1521 was ordained and made Dean of Gnesen. He stayed at Basle with Erasmus in 1524-25, and met some of the reformers there. On his return to Poland he received fresh benefices, and in 1538 became Archdeacon of Warsaw. In the same year he went to Frankfort, and thence to Mainz and the Netherlands. In 1542 he became pastor at Emden, where he set up a kind of Presbyterianism and met Hooper. In 1548 he arrived, by Cranmer's invitation, in England, and spent the winter at Lambeth. He was again in London in 1550, and became superintendent of the London church of foreign Protestants. He had great influence at the Court of Edward VI., and held extreme Protestant views. In 1553 he left England, and, after a short stay in Denmark, was again in Emden. His last years were spent in promoting the union of the reformed churches in Poland, and in helping to translate the Bible into Polish.

Lassalle, FERDINAND (1825-64), the founder of German social democracy, was born at Breslau of Jewish parentage. He refused to enter upon a commercial career like that of his father, and studied law, political economy, and history at Breslau and Berlin. In 1846 he took up the cause of the Countess Hatzfeldt, and, after eight years' litigation, succeeded in obtaining from her husband advantageous terms. In 1848 he was imprisoned for six months at Düsseldorf for the part he had taken in the revolutionary movement. Ten years later he came to live in Berlin. In 1861 he laid the foundation of his social and political system by his *System of Acquired Rights*. Lassalle's *Arbeiterprogramm*, or Labour Programme, called for a revolution against the capitalist system for the advantage of the large body of workers. There was no appeal to violence, but Lassalle was, nevertheless, prosecuted on this charge and, in spite of an eloquent defence, sentenced to four months' imprisonment. After his release he immediately set to work to show that German Liberalism was incapable of finding a solution for the political and economical situation, and to realise the aims of social democracy he founded in May, 1863, at Leipzig, the Universal German Working Men's Association, whose programme was universal suffrage and reform of the financial system. Having in vain tried to convert Berlin to his views, he now undertook a second campaign in the Rhine country, after the labours of which he sought rest in Switzerland. Here he met Helene von Dönniges, and a passionate attachment sprang up between them. The lady, however, was betrothed to a Roumanian nobleman, the Count Racowitza, whom she was compelled by her relations to marry. Lassalle, on receiving from her a letter of dismissal, challenged her father and the Count, and fell in a duel by the hand of the latter near Geneva.

Lassi, the dominant people of the province of Las, Baluchistan, to which they give their name, claim descent from a legendary Samar, founder of Samarkand, whose son Nerpat was the father of the Numri, of whom the Lassi are a branch. All, however, speak a language closely related to the Neo-Sanskritic dialect of Sindh (Lower Indus), and the features are distinctly of Rajput (Aryan) type. Four main divisions: Jokhyas, Jadgâls, Jets, and Numri (Lumri) proper.

Latakia, a port in Syria, 75 miles N. of Tripoli, on the site of the ancient Laodicea ad Mare. It has remains of Roman buildings, and was a wealthy city until far into the Middle Ages. The well-known Latakia tobacco is grown on the hills in the neighbourhood.

Latent Heat. When raised to a sufficiently high temperature many solids can be converted into liquids. During the transition the temperature (which is styled the melting- or freezing-point) remains constant, provided the pressure is unaltered, but heat is absorbed by the body. This heat, which produces change of state, and not rise of temperature, is known as the latent heat of fusion, and is generally defined as the amount of heat required to change one gramme of the solid substance into its liquid form. A similar absorption of heat without rise of temperature takes place at the boiling-point, when a liquid is converted into its vapour. This is called the latent heat of vaporisation, and is defined in similar units. The latent heat of water is 79, and of steam is 536, that number of C.G.S. units of heat being required to convert one gramme of ice into water, or water into steam. This heat is given out again when the process is reversed—i.e. the vapour liquefied or the liquid frozen.

Lateran, ST. JOHN OF (SAN GIOVANNI LATERANO), one of the chief Roman basilicas (q.v.), was built by Constantine about 333 on the site of a palace belonging to Plautius Lateranus, who was executed by Nero. It was completely altered by Sixtus V. (1586), who erected the present structure from designs by Fontana. The five œcumenical councils called Lateran (1123, 1139, 1179, 1215, 1518) received their name from being held in the church.

Latex, a milky emulsion occurring in special secretive structures in many plants. It is generally white, and its abundance gives the name *Lactarius* to a genus of fungi allied to the agarics. In *Chelidonium* it is orange, and among Dicotyledons its abundance is characteristic of the orders Moraceæ, Euphorbiaceæ, Sapotaceæ, and Papaveraceæ, and the sub-order Ligulifloræ of the Compositæ (q.v.). It occurs either in rows of small cells, as in the elder; in cells which grow to a large size and branch with the growth of the plant from the seed stage, as in some Euphorbiaceæ; or in a system of branching and anastomosing *laticiferous vessels*. These are generally in the bast region of the stem; but may also be in the young wood or pith. The fluid is mainly water with alkaloid in solution, and solid particles of rubber and albuminoid matter in suspension. In physiology (q.v.) its function appears

to be the conveyance of the "elaborated sap" from the leaves. Gutta, rubbers, and many medicinally valuable alkaloids are among the products of the latex.

Latham, ROBERT GORDON (1812-88), ethnologist and philologist, was born at Billingborough, Lincolnshire, of which his father was vicar. He was educated at Eton and King's College, Cambridge, and studied philology at Copenhagen and Christiania. In 1839 he became Professor of English in University College, London, at whose university he afterwards took the degree of M.D. His chief philological works were *The English Language* (1841), a new edition of *Johnson's Dictionary* (1870), and *Outlines of General Philology* (1878). In ethnology he produced *The Natural History of the Varieties of Mankind* (1850), *The Ethnology of Europe*, and several other works. He was the first who refused to accept the Central Asian origin of the Aryans.

Latimer, HUGH, the martyr, was born, probably about 1485, at Thurcaston, Leicestershire, where his father was a yeoman-farmer. He was well brought up, and taught archery amongst other things. In 1506 he went to Cambridge, and four years later was elected fellow of Clare Hall. Some years later he took orders, and in 1522 was licensed by the university to preach in any part of England. As early as 1525, however, he declared that he could not refute Luther's doctrines, and had to disown them. In December, 1529, he preached his two sermons *On the Card* in St. Edward's church, Cambridge. They excited a controversy which had to be silenced by royal command. His support of the king's divorce and the favour of Anne Boleyn stood him in good stead in the succeeding years. Early in 1531 he was instituted to the vicarage of West Kington, in Wiltshire. In 1532, however, he was inhibited from preaching in the diocese of London; but the influence of Cromwell and Anne Boleyn was strong, and, after having been one of the Lent preachers before the king in 1534, Latimer was appointed Bishop of Worcester in the summer of 1535. In a sermon before Convocation he also denounced purgatory and images, and he now began to be looked upon as one of the leading reformers. He was a regular attendant in Parliament in the session of 1539, but on the passing of the Six Articles resigned his bishopric. He also attempted to leave England, but was detained in the house of the Bishop of Chichester. On his liberation he was ordered to desist from preaching and not to visit the universities or his old diocese. In 1546 he was committed to the Tower on the charge of encouraging a reforming preacher named Crome, who was his friend. On the accession of Edward VI. he was released, and preached in 1548 four celebrated sermons at Paul's Cross, besides several in the King's Garden at Westminster. Soon after the accession of Mary he was summoned to London, but every opportunity was given him to escape. He refused to fly, and was committed to the Tower. In 1555 he suffered with Ridley, and died without much pain, uttering words which are now historical.

Latitude. In astronomy an imaginary great circle is drawn through a star and the pole of the ecliptic. The distance along this circle between the star and the ecliptic is its celestial latitude, and the distance along the ecliptic from the first point of Aries to the point where the same great circle cuts the ecliptic is its celestial longitude. These two measurements define the position of any celestial body.

Latitudinarians (Latin *latitudo*, "breadth"), a school of English theologians who in the 17th century sought to introduce a more liberal spirit into the Anglican Church. One of the chief aims of such men as John Hales and William Chillingworth was the union of all Christians, excepting Roman Catholics, into one communion, and to this end they endeavoured to minimise the importance attached to particular doctrines and ceremonies. In its later phases Latitudinarianism was represented by the "Cambridge Platonists," of whom Henry More was the most prominent, who laid stress on the intellectual element in religion, and sought to bring it into harmony with the teaching of the Platonic philosophy.

Latour d'Auvergne (1743-1800), THÉOPHILE MALO CORRET DE, a celebrated French soldier, called "Le premier grenadier de France," was born at Carhaix, Finistère. Having entered the army in 1767, he was present as a volunteer in the defence of Port Mahon against the English in 1781, and performed several exploits in the Spanish service. In 1789 he had attained the rank of captain, and he refused any further promotion. He served with the revolutionary armies in Spain, and was captured by an English cruiser in 1795. Released in 1797, he distinguished himself with the army under Moreau till his death at Oberhausen, in Bavaria.

Lattice-leaf (*Ouvirandra fenestralis*), a singular aquatic plant, growing in shallow water on the margins of running streams in Madagascar. The plant has fleshy farinaceous roots, which are used as food, and derives its popular name from the perforated condition of its oblong submerged leaves, which have hardly any mesophyll tissue within the meshes formed by the parallel longitudinal veins and the finer transverse ones. It belongs to the pondweed family (*Juncaginaceæ*).

Latude, HENRI MASERO DE (1725-1805), the celebrated prisoner, was born near Montagnac, Languedoc. In 1748, when he had come to Paris to complete his education in mathematics, he had an interview with Madame de Pompadour at Versailles, and warned her of the speedy arrival of a box of explosives through the post. When it was discovered that the contents were harmless, and that the whole thing was the stratagem of a young man to push his fortune, Latude was sent to the Bastille. After escaping from the donjon of Vincennes, whither he had been removed, he gave himself up, and remained in the Bastille for twenty-seven years, till 1777. His ingenious attempts to escape are related by Thierry. Soon after his release he came again to Paris, contrary

to express orders, and was again confined for seven years. He demanded and obtained compensation in 1793.

Latuka, a Negroid people of the Upper Nile basin, who occupy the uplands between the White Nile and the Sobat. Both in type and speech they have much in common with the Hamitic Gallas, and may be regarded as of mixed Galla and Negro descent. Morally also they differ greatly from the neighbouring Nilotic Negroes, being much more energetic, resolute, and brave; and, but for their incessant tribal feuds, the Latukas could not fail to become the dominant people in the Upper Nile region. Although wearing scarcely any clothes, they expend infinite labour on their hair, building it up in the form of a helmet and other fantastic shapes, which it takes eight or ten years to bring to perfection. Like their Bari neighbours, the Latukas show great skill in smelting and working iron, which is widely diffused throughout their territory.

Laud, WILLIAM (1573-1645), Archbishop of Canterbury, was the son of a Reading clothier. In 1589 he matriculated at St. John's College, Oxford, of which he became fellow in 1593. In 1601 he was ordained, and two years later was one of two Proctors of the university. In 1607 he obtained the vicarage of Stanford, Northants, and in the following year became Doctor of Divinity. After holding for a short time a living in Kent, he returned to Oxford in 1611 as president of his old college, and strongly opposed the Puritan party in the university. He became successively chaplain to the king, Archdeacon of Huntingdon, and Dean of Gloucester, and was appointed in 1621 Bishop of St. Davids. He was now intimate with the Duke of Buckingham. The accession of Charles I. greatly increased his influence, and, in spite of attacks made upon him in the House of Commons, he was promoted to the Bishopric of London in 1628. Two years later he became Chancellor of Oxford, in whose university and in the metropolitan diocese he began to impose silence on Puritan preachers and in other ways to carry out the king's views. In 1633 he was appointed Primate, and thenceforth worked to carry out uniformity and the due observance of ritual. At the same time he resisted the Romanising influences of the Queen's coterie. It was Laud who persuaded the king to force on the Scots the English Liturgy rather than that prepared by their own bishops; and he supported Strafford in his Scottish, as in other branches of his policy. On December 18, 1640, articles of impeachment were by an unanimous vote carried against him, and he was sent to the Tower in the following February. Here he had to wait for two and a half years before he was tried. In November, 1643, he was charged with endeavouring to subvert the laws and overthrow the Protestant religion; and though the judges, when consulted, declared that these charges did not strictly amount to treason, the Presbyterians obtained his condemnation to death by an ordinance of both Houses. He was executed in 1645.

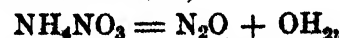
Laudanum is the term applied to a tincture of opium (q.v.), i.e. a liquid extract of this drug by

means of alcohol. The word was formerly used for various preparations, but is now restricted to the above tincture. It is very largely employed as an opiate and anodyne, being the most general form of opium extract. It has a brownish-red colour and characteristic odour, with a peculiar woody taste.

Lauderdale, JOHN MAITLAND, DUKE OF (1616-82), a Scottish administrator who gained for himself much odium among the Scottish Covenanters as the Viceroy of Charles II. He succeeded to the title of Earl of Lauderdale in 1645, and in 1657 was made prisoner at Worcester, and suffered nine years' imprisonment. At the Restoration he was made Secretary of State in Scotland, and used all his influence to advance the power of the Crown. He was in high favour with the king, was made Privy Councillor, and was a member of the famous Cabal, and was created Duke in 1672. An attempt to pass censure upon him was made in the House of Commons in 1678, but without success. He died at Tunbridge Wells. His private life conformed to the general type of the period.

Lauenburg, a district of the Prussian province of Schleswig-Holstein, situated on the right bank of the Elbe, between Hamburg, Holstein, and Mecklenburg. It was once a separate duchy, and came finally into the power of Prussia in 1865. Inhabited in early times by a tribe of Slavs, it came later into the possession of Saxony, and in 1705 it formed part of George I.'s Hanoverian Electorate. In 1815 it was made over to Prussia, who ceded it to Denmark, to resume it later. The surface, of 453 square miles, is generally flat, with some irregularities, and the soil, partly sandy partly alluvial, is well cultivated. There are lakes and forests, and the Stecknitz Canal connects the Elbe with the Trave, and it is on the railway from Hamburg to Berlin. Cattle-breeding is carried on, and the chief productions are timber, fruit, hemp, grain, flax, and vegetables. The town of Lauenburg is on the Elbe, but the present capital is Ratzeburg.

Laughing Gas. The gas known as laughing gas, owing to the slight and temporary form of intoxication which its inhalation first produces, consists of an oxide of nitrogen, nitrogen monoxide, N_2O . The further inhalation, however, soon produces insensibility, and the gas is hence used largely as an anæsthetic. It may be prepared by heating ammonium nitrate,



when it is obtained as a colourless gas slightly soluble in water, and condensable by cold or pressure to a colourless liquid. If used for medicinal purposes care must be taken to purify it from other oxides of nitrogen, which is accomplished by passing it through solutions of (1) potash, (2) ferrous sulphate. [NITROGEN.]

Laughing Jackass. [KINGFISHER.]

Launce, called also SAND LAUNCE and SAND EEL, any fish of the Anacanthinous genus Ammodytes. They are slender and eel-like, with the dorsal

fin running nearly the whole length of the back, and frequent sandy coasts on both sides of the North Atlantic.

Launceston. 1. An inland municipal and market town of Cornwall, almost on the border of Devon, and 50 miles W. of Exeter, is on a height near the Kinsey, a feeder of the Tamar. Originally Llanstephen, it belonged to the Earls of Cornwall from the time of the Conquest, and was till 1838 a county assize town. The trade is chiefly in agricultural produce. The 16th-century church of St. Mary Magdalen is notable for its carved blocks of granite and its detached tower dating from the 14th century. There are also remains of an old castle, seat of the Earls of Cornwall, besieged in the Civil War, and the scene of the Quaker Fox's imprisonment. The old grammar school of Edward VI. was rebuilt in 1862. Pop. (1901), 4,053.

2. The second town (and since 1889 city) of Tasmania, forming the principal port of entry to the island on the north, and having steam connection with Melbourne and Sydney, and connected also with the former by submarine telegraph. There is a railway of about 130 miles to Hobart. The city is at the junction of the North and South Esk to form the Tamar. Besides the church (1824) there is a Government House, a post-office, a theatre, a hospital, a town hall, a library, and a large convent.

Launch, a peculiar kind of long-boat. Steam-launches are the largest steamboats supplied to ships of H.M. Navy. They are 42 feet long, and weigh with engines and boiler from 148 cwt. to 155 cwt. Their indicated horse-power is about 35, and their speed generally about 8 knots.

Launching, the placing in the water of a ship that has been built upon a slip. She is supported upon a strong timber cradle, which rests upon inclined "ways" that have been carefully greased. The whole weight of the ship is brought gradually to bear upon this cradle, and then, at the desired moment, the retaining "dog-shores" are knocked away, and the cradle, with the vessel on it, slips into the water. Vessels weighing at the time as much as 7,500 tons have been successfully launched in Great Britain. At the launch of a man-of-war it is customary for a bottle of wine to be broken on her bows when her name is given to her, for a short religious service to be read, and for the Union Jack, Admiralty flag, royal standard, navy flag, and white ensign to be displayed in the order named from flagstaffs specially erected for that purpose in the ship.

Lauraceæ, a natural order of dicotyledonous trees, comprising some 400 or 500 species in about fifty genera, mostly tropical and aromatic. They have exstipulate leaves dotted with oil-glands; inconspicuous flowers with eight to twelve stamens, the anthers of which open by recurved valves; and a superior ovary giving rise to a one-chambered, one-seeded drupaceous fruit. Among the chief members of the order are *Laurus nobilis*, the bay; *Nectandra*, the greenheart; the avocado pear, the

camphor-laurel, the cassia, the cinnamon, and the sassafras, which are mentioned separately.

Laureate, POET. Amongst all the races of Western Europe minstrels appear to have been included in the retinue of royal persons from the earliest period of which there is any record. This was the case in England as elsewhere, but the term "poet laureate" was not used to denote an officer of the royal household receiving a fixed salary until the reign of James I. The laurel wreath was a recognised badge of the poet, especially if he had actually received it as a mark of distinction from some university; and during the Middle Ages the term "laureate" was frequently used both in the looser and in the more exact sense. In 1616 the title was conferred upon Ben Jonson, with a salary of 100 marks, which in 1630 was increased to £100, with the addition of an annual terce of canary. The latter was commuted for £27 at the end of the 18th century. The list of poets laureate includes Dryden (1670-89), Southey (1813-43), Wordsworth (1843-50), Tennyson (1850-92), and Alfred Austin (1896-).

Laurel, the popular name for a variety of ever-green shrubs. The Alexandrian laurel is *Ruscus racemosus*; the Bay laurel, Poet's laurel or Roman laurel, *Laurus nobilis*; the Japan or spotted laurel, *Aucuba japonica*; and the Portugal laurel, *Cerasus lusitanica*; but now the name is most commonly applied in England to the cherry laurel, *Cerasus laurocerasus*. This shrub, introduced from the Levant in the 16th century, agrees with the cherry (q.v.) and differs from the plum (q.v.) in having its leaves conduplicate, or folded in the bud down the midrib, and in having a polished fruit without bloom. The leaves are elliptic-lanceolate, and of a bright, shining green; the small white flowers are in terminal racemes; and the drupes are black with smooth stones. The leaves, bark, and kernels yield a volatile oil containing cyanogen, in which some prussic acid is generally formed. This renders the use of the leaves in flavouring custards, as a substitute for bay-leaves, most dangerous. The leaves, when crushed, are used by entomologists to poison butterflies and moths.

Laurentian Rocks, the lowest series of Archæan rocks in North America, named by Sir William Logan from their development along the shores of the St. Lawrence, where they cover an enormous area. They are at least 30,000 feet thick, but their base is unknown. Logan divided them into two series—the *Lower*, over 20,000 feet thick, of granitoid gneiss, quartzite, and crystalline schists, with iron-ore and limestone; and the *Upper*, said to rest unconformably on the lower, 10,000 feet thick, of gneiss with much Labradorite (q.v.), as well as schist, iron-ore and limestone. The succeeding Huronian (q.v.) is said to rest unconformably on the Upper Laurentian. In the Lower Laurentian occurs the structure known as *Edzoön* (q.v.), once thought to be of animal origin. Archæan rocks of a similar lithological character to those of Canada, such as the Hebridean gneiss of the Highlands, were formerly termed Laurentian.

Laurustinus, or **LAURESTINE** (*Viburnum tinus*), a favourite evergreen shrub, native to the Mediterranean region, forming large woods in Corsica, but quite hardy in Britain. Its oblong leaves are a dark green; but its small corymbose cymes of white flowers with pink stalks are attractive at a very early season of the year. Its berries are a dark blue. The genus to which it belongs is that of the Guelder-rose.

Lausanne, a Swiss city, capital of the canton of Vaud, is on the S. slope of the Jura mountains, and near the N. shore of the Lake of Geneva—a railway connecting it with the village of Ouchy, which is the harbour and enjoys a considerable trade. The valley of the Flon divides the city into two parts, and is crossed by a bridge 617 feet long and 80 feet high. The 13th-century cathedral of



LAUSANNE.

(From a Photograph by Frith and Co.)

Notre Dame is interesting as the scene of Calvin's disputation in 1536. There are two museums, a large corn-market, an academy, and many educational institutions which attract many visitors. Here Gibbon is said to have written much of his work on Roman history, and at Ouchy Byron wrote *The Prisoner of Chillon*.

Lausun, ANTOINE NOMPARE DE CAUMONT, DUC DE (1633–1723), favourite of Louis XIV., served under James II. in Ireland in 1689, was imprisoned in the Bastille, and is said to have secretly married the Duchesse de Montpensier.

Lava. [LAO.]

Lava, a general term for all those rocks which flow in a molten condition from volcanoes (q.v.). They differ very much in the extent to which they are saturated with steam and other gases, and also in composition, texture, density, and colour. Some are *acid*, containing 60 to 80 per cent. of silica, often pale buff in colour, and with a specific gravity between 2.3 and 2.7. Such are the liparites, trachytes, obsidian, pitchstone, and most pumice. Others, such as the basalts, are *basic*, with 45 to 50

per cent. of silica, much oxide of iron and such minerals as augite and olivine, and a density between 2.7 and 3.3. These are mostly dark grey or black, though the iron rusts on exposure. Lavas may be entirely *glassy*, as are obsidian and pitchstone; *vesicular*, like pumice; *semi-crystalline*, as in the bulk of volcanic rock; or even wholly *crystalline*, as are some liparites and basalts. The expansion of the contained vapours causes the lava to rise in the crater; and, though it may reach the rim and overflow it, its great density, exerting a pressure of about 120 lbs. per square inch, or 7 or 8 tons per square foot, for each 100 feet of the height of the column, generally forces it out as *veins* and *dykes*, fissuring the sides of the cone, and even rising sometimes in a fountain of molten rock. It glows with a white heat, being at first considerably more than 2,000° Fahr., steam and other vapours (especially that of salt) escaping from it at jets, known as *fumaroles*, and long hanging over it as a cloud. The motion of the stream has been compared to that of honey; but its rate varies not only with the slope and with the volume of the stream, but also with its fluidity. A stream from Vesuvius in 1805 travelled nearly four miles in four minutes, and one from Mauna Loa, in 1852, fifteen miles in two hours. It cools from white to red, and from red to black, with a slaggy, cindery surface, widening out at the foot of a slope and ending in a slowly-advancing wall like a mound of clinkers. A lava-flow may be many years before it has completely cooled; but, contrary to the opinion once held, it may consolidate on a surface inclined 35° or even 40°. In volume, the largest recorded outpouring was that of Skaptar Jökull, in Iceland, in 1783, when two streams flowed forty miles and fifty miles respectively, in opposite directions, with a width of from twelve miles to fifteen miles and a depth of 100 feet, deepening in river-gorges to 600 feet. The upper part of the lava-stream is generally pumiceous and glassy; but even in obsidian there are small crystals, and the bulk of the flow in consolidating has usually become at least semi-crystalline or micro-crystalline.

Laval, capital of the French department of Mayenne, the old town being situated upon the right bank of the river Mayenne and the new town on the left bank. The river is crossed by a 16th-century bridge, a good stone bridge, and a railway viaduct, and has steam communication with Angers. The town, which is 46 miles E. of Rennes, and 180 miles W. of Paris, received an influx of Flemish weavers in the 14th century, and is still a great centre of linen and ticking manufacture. There are also foundries, tanneries, paper- and dye-works, and flour-mills; and marble for lime-making is quarried in the neighbourhood. Besides a large cloth hall other interesting buildings are a church of the 12th century, an old castle (now a prison) a museum and library, and some remains of ancient fortification.

La Vallière, LOUISE FRANÇOISE DE (1644–1710), a mistress of Louis XIV., was born at Tours of an old noble family. Her mother, marrying again brought her to Court, where she attracted the notice of Louis. Though lame, she retained his favour for some time, and bore him four children. When

discarded for a successor she retired to a convent and took the veil, spending the rest of her life in religious exercises. Her *Réflexions* were published in 1680 and 1854, and a collection of *Letters* in 1767.

Lavater, JOHANN (1741-1801), a Swiss theologian, was born at Zurich. He took Orders in 1769, and soon gained a reputation as an orator, a casuist, a woman's preacher, and a mystic. He was an acquaintance of Goethe, of whom he has given a description; but his chief claim to modern regard is as a phrenologist and physiognomist, and his *Physiognomische Fragmente* owe much of their renown to their illustrations. Lavater died of a gunshot wound during the French occupation of Zurich.

Laveleye, ÉMILE LOUIS VICTOR DE (1822-92), a Belgian political economist, was born at Bruges, and educated at Ghent and Paris. He was appointed to the chair of Political Economy at Liège in 1864, and was a diligent contributor to magazines both home and foreign. Among his works are *Property and its Primitive Forms*, *Letters from Italy*, *Socialism of the Present Day*, *Elements of Political Economy*, and *The Balkan Peninsula*.

Lavender (*Lavandula vera*), an aromatic undershrub, native to the south of Europe, belonging to the order Labiatæ (q.v.), which is largely cultivated in France and in England for its perfume. It grows 2 or 3 feet high: its branches are polygonal; its leaves, linear, glaucous, and with revolute margins; and its flowers in spikes of verticillasters of the greyish-blue which takes its name from this plant. The calyx is ovate and ribbed, the corolla with distinctly-lobed lips, and the stamens bent forward. The flowering branches are largely used to protect linen from moth, and are imported from France in bales of 200 lbs. each. The essential oil of lavender is distilled from the flowers, and is imported in pound bottles and in tins. The plant is grown about Mitcham, in Surrey, but the French oil is cheaper than the English. *Lavender water* consists of the essential oil dissolved in rectified alcohol with other essences. *Red lavender drops* contain oil of rosemary and colouring matters. They are used as a stimulant in flatulence, hysteria, and faintness.

Lavender Water. By the distillation of the lavender flowers with water, a volatile oil known as *oil of lavender* is obtained, from which the lavender water is formed by dissolving it in spirits with the addition of rose-water or other perfume, and subsequent distillation. If the lavender flowers be distilled at once with spirits instead of with water, *spirits of lavender* are obtained consisting essentially of the oil dissolved in the alcoholic liquid.

Laver, a condiment obtained either from the common red seaweed, *Porphyra vulgaris*, or from the allied green species, *Ulva Lactuca* and *U. latissima*, which are even more common upon our coasts. The seaweed is heated with stock and lemon juice, and is eaten as a sauce with roast mutton, its strong flavour of iodine being much relished by the initiated.

Lavoisier, ANTOINE LAURENT (1743-94), one of the founders of the modern theory of

chemistry, was born in Paris of a wealthy family. An essay on the best way of lighting Paris brought him into notice, and in 1768 he became an Academician. In 1769 he was appointed Farmer-General, and in 1776 he introduced improvements in the mode of making gunpowder. In 1769 he was made commissary of the Treasury. Besides establishing a new theory as to the nature of oxygen, he applied the principles of chemistry to agriculture, and made valuable researches in geology and kindred subjects. Among his works are an *Elementary Treatise on Chemistry*, and a work *On the Territorial Riches of France*. His services did not prevent his being guillotined.

Law, JOHN (1671-1729), the noted financier and company-promoter, was born at Edinburgh. The son in his early days was noted for his mathematical powers and his luck or skill in gambling. A visit to London led to his falling into debt and selling his estate of Lauriston to his mother, and terminated in a duel, a commuted death sentence, and an escape to the Continent, where he studied finance at Amsterdam. In 1700 he was in Scotland proposing a Council of Trade and other economical measures, and his proposal for a State Bank with a large issue of paper gained him a reputation as a financier in London. For some years then he travelled on the Continent, gambling and proposing financial schemes. In 1716 the French Regent allowed him to start a bank and issue paper. The success of this was so great as to encourage him to put forth his "Mississippi Scheme" for the settlement of Louisiana; and, in spite of the jealousy of the Parliament, his bank became in 1718 the Royal Bank, and he had control of the Mint. The scheme flourished during 1719 and the early part of 1720, and great fortunes were won and lost in speculation; but the crash came, and Law had to fly the country, his property being confiscated. Declining an invitation from Peter the Great to St. Petersburg, he settled for some years in England, and finally died at Venice.

Law, WILLIAM (1686-1761), a celebrated English non-juror clergyman, chiefly known to later generations as the author of the *Serious Call*, a collection of half-allegorical sketches of men and women with morals appended, which owes much of its renown to Dr. Johnson's praise of it. He took Orders in 1711, but refused the oath of allegiance at the accession of George I. His life was thenceforward spent chiefly in comparative retirement at King's Cliffe, where he established a girls' school, and where dwelt two ladies in a kind of religious sisterhood, one of these ladies being a Miss Gibbon, of whose family at Putney Law had been an inmate in 1727. He was friendly with the Wesleys, who, however, found his views too mystic. Among his works were *Three Letters to the Bishop of Bangor*, an attack on Mandeville's *Fable of the Bees*, and a condemnation of the stage. The *Serious Call* appeared in 1728.

Lawrence. 1. A town of Kansas, U.S.A., capital of Douglas county, situated on both sides of the river Kansas, 40 miles above its junction with the Missouri. It is a railway junction, and has a good

trade, one of its special industries being pork-packing. It contains the state university, and there are carriage-works, mills, and other industries. The town was founded by Abolitionists, and was consequently in bad odour, and was partly burnt in 1856, and again in 1863.

2. A town in Essex county, Massachusetts, U.S.A., on the banks of the Merrimac, and 26 miles N. of Boston. It has considerable manufactures, the water-power of the river being utilised by means of a dam and canals which distribute the power. The granite dam is 1,629 feet long. Four bridges, two of which are railway bridges, cross the river. The chief industries are cotton-, woollen-, and cloth-working, paper-making, and engine, boiler, and machinery shops.

Lawrence, HENRY MONTGOMERY, SIR (1806-57), an English soldier and statesman, was born in Ceylon, and entered the Bengal Artillery in 1823. He took part in the Burmese War of 1828, in the Afghan War of 1838, and in the Sikh Wars of 1845 and 1848, after the latter of which he was made K.C.B. He foresaw the Mutiny, and this enabled him successfully to hold out when in charge of the Residency at Lucknow. He died from a shell wound during the defence. The Lawrence Military Asylums owe their existence to the interest he took in the soldier.

Lawrence, JOHN, LORD (1811-79), known as the "Saviour of India" for his services during the Mutiny, brother of the above, was born at Richmond, Yorks. In 1827 he entered at Haileybury, where he carried off the chief prizes, and then entered the Indian Civil Service, the neighbourhood of Delhi being the chief scene of his early labours. In the Punjab he became very popular by reason of his protection of the peasants against the tyranny of the chiefs and the good system of land tenure which he introduced; and this popularity it was that enabled him to raise an army of 59,000 Sikhs and capture Delhi. In 1861 he received the Star of India, and in 1863 was appointed Governor-General. In 1869 he was made Baron Lawrence, and during 1870-73 was on the London School Board. He had strong opinions about the interference of England in Afghan affairs, and was opposed to the Afghan campaign of Lord Roberts.

Lawrence, THOMAS, SIR (1769-1830), an English painter and P.R.A. He was born in Bristol, and at the age of 18 he entered the Royal Academy as a student, and soon drew the attention of the world as a portrait-painter. George III. took him up, and caused him to be made A.R.A. in 1791. In 1798 he became R.A., in 1815 was knighted by the Regent, and in 1820 he succeeded Benjamin West as President of the Academy. Among the numerous subjects of his pencil were Pope Pius VII., Miss Farren the actress, John Kemble in character, Miss Siddons, Wellington, Metternich, Blücher, and the crowned heads of the Vienna Congress.

Lawson, SIR JOHN, English seaman, was born about 1608, and served in the Parliamentary army and fleet during the Civil War. He was afterwards with Penn in the Mediterranean, and was made

rear-admiral of England in 1652, vice-admiral of the Red, and admiral of the Blue in 1653, and immediately afterwards vice-admiral of England. In 1665 he was wounded, and died from his injury.

Layamon, an early English poet of whom little is known, was the son of Leuca or Leovenath, and was a priest at Ernly, on the bank of the Severn. He flourished during the 12th century, and his poem of *Brut d'Angleterre* is valuable as showing the transition of Anglo-Saxon to the English of Chaucer and the beginning of a unity of interest between the English and Celtic elements of the country. His poem was founded upon Wace, and there are two texts extant which show a remarkable absence of French-derived words.

Layard, AUSTEN HENRY, SIR, G.C.B., was born in 1817. Born in Paris, he spent his boyhood in Italy, and at 16 went to London to study law. In 1839, while on the banks of the Tigris during an overland journey to Ceylon, he was struck by the ruins which were said to be those of Nineveh. In 1845 he obtained leave to explore, and in the following years brought to light four palaces, one of which is thought to have been built by Sardanapalus. Lord Stratford de Redcliffe gave him pecuniary aid in his researches, and Parliament made a grant for the purpose. He was Foreign Secretary (1861-66), and during the Russo-Turkish war was ambassador at Constantinople, and sympathised with the Turks. Among his writings are *Nineveh and its Remains* (1849), *Monuments of Nineveh* (1853), *Early Adventures in Persia, Babylonia, and Susiana* (1887). He died in 1894.

Lazes, the westernmost branch of the Georgian race, who give their name to the mountainous region of Lazistan, on the south-east side of the Black Sea. Unlike the other members of the group, who are Christians, the Lazes are Mohammedans, and were all subjects of Turkey till 1878, when the rectification of frontiers after the Russo-Turkish War, assigned a considerable section of the nation (Batoum district) to Russia. Their speech differs little from the Mingrelian dialect of Georgian, but it has borrowed a large number of loan words from the surrounding Greek and Turkish populations. The Lazes are physically a fine race, brave, courteous, and fond of show in their picturesque national costume; they make excellent sailors, and many emigrate from their overcrowded upland valleys, seeking employment as artisans as far west as Constantinople. (Deyrolle, *Lazistan et Arménie*, in *Tour du Monde*, 1875-76.)

Lazzaroni (Italian, augmentative of *lazzaro*, a "leper" or "beggar"), a class peculiar to Naples, where, up to a recent period, they existed in large numbers. They found casual employment as messengers, porters, etc., but earned their livelihood chiefly by begging.

Lead (Pb. 206.4), being one of the commonly occurring metals, has been known from early times, and mention of it occurs in different places in the Scriptural writings. It was formerly, however, much confounded with tin, the two being regarded as varieties of the same metal, and distinguished

as *plumbum nigrum* and *plumbum candidum*. By the early alchemists lead was known by the sign of the planet Saturn (♄), who were also acquainted with some of the salts—*e.g.* sugar of lead. By the Romans the metal was employed for many of the purposes to which it is still applied, while solders of lead and tin were also used. It does not occur free to any extent in nature, though many of its compounds are widely distributed. Those almost exclusively employed for the production of the metal are the sulphide—*galena* (q.v.), and, to a less extent, the carbonate—*cerussite*, or *white lead ore*. The former occurs in many localities in Great Britain—*e.g.* Derbyshire, Cumberland, Cornwall, Wales, Scotland, in the Isle of Man—and abundantly in Spain, in the Hartz Mountains, and in the United States. The carbonate occurs frequently associated with the galena in the above localities. Other minerals also, as *anglesite*, *matlockite*, *crocoisite* *pyromorphite*, etc., contain lead, but are not used as sources of the metal. The smelting of lead is effected with more ease than that of most metals. It was produced in England during the Roman occupation, and remains of some of the ancient furnaces still exist. The method usually employed (known as the Welsh method) is briefly as follows:—The galena is mixed with a small quantity of lime and heated in a reverberatory furnace. During this heating, part of the sulphide is converted to sulphate and a part to oxide, sulphur dioxide being evolved. More lime is added and the temperature increased, when the sulphate and oxide both react upon the unchanged sulphide with formation of lead. The lime forms a thick slag with the earthy matter of the ore, which is raked off the surface of the metal. The lead so obtained is, however, impure, containing usually antimony and other foreign metals, which impair its quality. It is purified by remelting, and partly oxidising, the foreign metals being the first to oxidise, forming a scum on the surface which is taken off. The galena also frequently contains silver, which remains in the molten lead, and this can be profitably extracted, even when present in very small quantities. [SILVER, PATTINSON'S PROCESS, PARKE'S PROCESS.] Thus obtained and purified, lead is a blue-grey metal, with metallic lustre, which soon tarnishes by exposure. It may also be obtained in octahedral crystals. It is so soft that it can be cut by the finger-nail, and will mark paper. The hardness is, however, greatly increased by the presence of small quantities of antimony and other metals. It has a specific gravity of 11.3. It cannot be drawn into wire, but may be rolled into thin sheets. It melts at 327°C ., and with tin, etc., forms alloys, which melt at comparatively low temperatures. It is not acted upon to any extent by sulphuric acid or by muriatic acid. It is hence used for making the chambers in the manufacture of the former acids. It finds very many applications in industrial processes, dependent chiefly on its low melting-point, its softness, malleability, and its permanence if exposed to the atmosphere. Water, however, slowly corrodes lead, the action being increased by certain salts, but diminished by others. Hence, traces of lead are

usually found in water kept in lead cisterns or passing through lead pipes, and may give rise to lead-poisoning. It forms many oxides, chief of which are *litharge* or *massicot*, the monoxide and PbO ; and *red-lead*, Pb_3O_4 . The latter is a scarlet crystalline powder obtained by carefully heating powdered litharge. It is largely used as a pigment and in the production of lead-glass—*e.g.* flint-glass. The salts of lead correspond with the monoxide—*e.g.* PbCl_2 , etc. Of these most are insoluble, the nitrate and acetate being the only common soluble lead salts. The acetate known as *sugar of lead* is a white crystalline powder obtained by the action of crude acetic acid upon litharge. It has been long known, and used to a small extent medicinally, chiefly in conjunction with opium, as an astringent and sedative. The *chromates* of lead are used as yellow pigments, whilst a basic carbonate forms a very common white pigment under the name of *white-lead*. It has the disadvantage of blackening by action of sulphur compounds. It was formerly chiefly prepared by the *Dutch process*, which consisted of placing the lead in thin sheets in pots of weak vinegar, and surrounding the pots with decaying tan or dung. The acetate is first formed, which is converted by the carbonic acid evolved during the putrefaction into the basic white lead. Other methods have now largely superseded this process. All the compounds of lead are poisonous, and even in small doses produce in time cumulative or chronic lead-poisoning, observed more especially in occupations involving the use of the carbonate of lead. Qualitatively, it is usually recognised in its compounds by its insoluble chloride, which dissolves in hot water, and, quantitatively, it is usually estimated as the sulphate. The atomic weight 206.41 assigned to it was carefully determined by the chemist Stas.

Lead, SUGAR OF. [LEAD.]

Lead, THE, the simplest form of sounding apparatus, whereby a ship discovers the depth of water beneath her. It is composed of a long block of lead of from 7 lbs. to 14 lbs. weight, attached by means of a thong to a long line called the lead-line. The lower end of the lead is hollowed to receive tallow, to which, in sounding, some specimen of the bottom may adhere. The line, about 20 fathoms long, is thus marked: 2 fathoms, a piece of leather with two strips; 3 fathoms, a piece of leather with three strips; 5 fathoms, white rag; 7 fathoms, red rag; 10 fathoms, a piece of leather with a hole in it; 13 fathoms, blue rag; 15 fathoms, white rag; 17 fathoms, red rag; 20 fathoms, two knots. For deep-sea work, leads weigh as much as 30 lbs.

Lead, WHITE. [LEAD.]

Leaf, a lateral appendage of the stem of a plant, differing in form and structure from the stem that bears it. Thallophytes (q.v.) have no leaves, and those of mosses (q.v.) are generally only a single layer of cells. Those of the higher plants (ferns and their allies and flowering-plants) are at first merely protuberances of cellular tissue, produced laterally in acropetal (q.v.) succession from the apex of a shoot; but when mature they

have an epidermis (q.v.), internal cellular tissue or *mesophyll*, and a fibro-vascular skeleton of so-called *ribs*, *veins*, or *nerves*. Leaves may be circular in section, as in onions and rushes, or flattened in a vertical plane, as in *Iris*, but are most commonly flattened horizontally, and the upper and under surfaces, differing in structure and function, are termed *dorsi-ventral*. In ordinary foliage-leaves the upper surface is a darker green, and has the *palisade-tissue* of closely-packed prismatic assimilating cells immediately below its epidermis, whilst the lower surface has more stomata (q.v.) and loose *spongy parenchyma* (q.v.), a transpiring tissue, internally. Ordinary green foliage-leaves have three chief functions:—(1) *Assimilation* (q.v.), or the taking-in and decomposition, in the presence of chlorophyll and under the influence of light, of carbon dioxide from the air, forming carbo-hydrates and liberating oxygen; (2) *transpiration*, or giving off water-vapour through the stomata, especially in dry weather; and (3) *respiration* (q.v.), or inhaling small volumes of oxygen and exhaling carbon dioxide. In addition to these, many of the processes of metabolism (q.v.) go on in the leaf, which is at once, as it were, the mouth, lungs, and stomach of the plant. Though plants usually obtain their nitrogen from the soil by their roots, some leaves, especially those with glandular hairs, may take in ammonia compounds in dew or rain-water, and those of the various carnivorous plants (q.v.) are adapted for obtaining nitrogen from captured insects or other animal matter, either as a product of decay or of a true digestive process. Leaves in some cases act as climbing organs, either by twisting their stalks round the support, as in *Clematis*, or by being partly transformed into tendrils (q.v.). In addition to ordinary green foliage-leaves, there are on various special regions of the stem structures which in origin, development, and structure are truly leaves, though very variously modified. Such are the *cotyledons* (q.v.), or primary leaves of the seedling, which often serve as a food reservoir, though sometimes (in epigeal germination [q.v.]) afterwards becoming green and acting as typical leaves. Underground stems bear *leaf-scales* or *cataphyllary leaves*, generally without chlorophyll and broad-based, representing the sheaths of ordinary leaves. These in bulbs are fleshy and act as food reservoirs, whilst in the tooth-wort (*Lathraea*) they have absorptive glands and take in food from decaying leaves. On the aerial stems of many parasites and saprophytes the leaves are represented by similar reduced scales and outside buds; they perform, under the name of *perulae*, a protective function. In the region of the inflorescence (q.v.), in addition to the variously-modified leaves, sepals, petals, stamens, and carpels that form the bulk of each flower, there are reduced *hypsophyllary leaves* or *bracts* (q.v.), narrow at the base and variously coloured, representing sessile leaf-blades.

Leaf Insects, a number of insects forming the genus *Phyllium* of the family Phasmidæ. The whole insect is much like a leaf, and the legs are often also expanded out into leaf-like structure. They usually live in the tropics, and there may attain a

size of over an inch in length. They are sluggish insects, being protected by their *mimicry* (q.v.).

Leaf-nosed Bats, the family Rhinolophidæ, from temperate and tropical parts of the eastern hemisphere. They are distinguished by their enormous leaf-like growths on and around the nostrils, and the cusped molars fitted to crush the wing-cases of the beetles on which they feed.

League, three miles; three nautical miles, *i.e.* the 20th part of a degree of a great circle, or 5,560 metres.

Leake, SIR JOHN, English naval commander, was born in 1656. He early entered the navy, and was in 1688 promoted to be commander. He was posted in 1689 into the *Dartmouth*, in which he most gallantly led the historic relief of Londonderry in face of an army of 30,000 men. He took part in the reduction of Cork, and in the battle of Cape Barfleur. In 1694 Leake went to the Mediterranean, where he assisted in the blockade of Toulon. In 1702 he was made Governor and commander-in-chief at Newfoundland. At the end of the same year he attained flag-rank. He continued employed in responsible command, assisted in the capture of Gibraltar and the battle of Malaga, where he was wounded, and became commander-in-chief in the Mediterranean. He co-operated in the reduction of Barcelona, raised the subsequent French siege of that place, captured Alicante, and restored Majorca, Iviça, and Palma to Spain. In 1708 he was promoted to be Admiral of the Fleet, and, returning to the Mediterranean, captured Sardinia and Minorca. He subsequently joined the Board of Admiralty, refused a peerage, and in 1712, once more in command, captured Dunkirk. He died in 1720.

Leake, or LAKE, SIR ANDREW, naval commander, born about 1660, became a captain in 1690. In 1700 he was commodore at Newfoundland, and in 1702 was present at the attack on Vigo. He assisted at the capture of Gibraltar, and at the battle of Malaga he was mortally wounded.

Leap Year. The true solar year is 365 days 5 hours 48 minutes 50 seconds long, so if one year begins at 12 o'clock midnight, the next should rightly start about 6 a.m., and the following one at 12 noon. This would cause great inconvenience, and to avoid it an extra day is introduced into the month of February every fourth year, which is called leap year. Usually February has 28 days, but in leap year it has 29. The year whose number is exactly divisible by four is leap year. The correction of one day in four years is rather too big, and to compensate for it the extra day is omitted three times in every four centuries. That century the number of whose year is exactly divisible by 400 is a leap year, the others are not.

Lear, EDWARD (1812-88), English painter and author, was born in London. From 1832-36 he was at Knowsley in the family of the Earl of Derby, and drew plates for the *Knowsley Menagerie*. It was for the Earl's grandchildren that he composed his *Book of Nonsense*, which was followed by many other nonsense books at intervals, which attained

almost as much popularity as the original book. In 1837 he left England on account of his health, and stayed for a time in Rome, and sketched about Southern Europe, the result being his *Landscape-Painter in Greece and Albania*.

Lease. A lease or letting is sometimes termed a demise. He who lets land, whether for agricultural purposes or merely a piece of land with a dwelling-house thereon, is called the lessor, and he to whom land is let is called the lessee. A lease is not strictly a conveyance, though it is sometimes so termed. It is merely an interest in land or houses for a certain time and on certain specified terms. The fact of a lease for years being treated as an estate does not alter its nature as above explained. The reservation of a rent is not essential in a lease, but payment of rent is now the chief condition on which lands are let. To constitute a valid lease it is necessary that it should be by deed (*i.e.* under seal), and that the subject of it should be demised or let for a shorter period than the lessor's interest therein; for if a man parts with all his interest, the document creating such interest, whatever terms be used therein, is an assignment, and not a lease. The relation created by a lease between the lessor and the lessee is that of landlord and tenant on certain specified terms (varying more or less the ordinary relation of landlord and tenant). The lessor has a reversion in the land demised—that is, after the expiration of the lease, the land reverts to him. The lessor, by virtue of this reversion, has the power of distraining on the land for the rent agreed upon, and for the service which may be due by the terms of the lease and fealty is always due to the lessor. The ordinary lease is that for a term of years, by which lease a rent, generally payable in money at stated times, is reserved to the lessor. These are usually quarterly payments. In the absence of express agreement to the contrary, there is no suspension of rent in case of fire.

Least Squares, METHOD OF. In making measurements, or using instruments of any kind, different observations of the same thing do not agree. Besides errors of the instrument which can be corrected in different ways, other errors, not reducible to any law, and often depending on the observer himself, still remain. From the number of observations taken, that value has to be found which is nearest to the truth. In direct observations on a single quantity the arithmetical mean gives the best result, but this is not the case with observations on several quantities. The method of least squares is then employed. It is based on the theory of probability, and is much used in physical research.

Leather, a substance obtained by subjecting the skins of certain animals to processes which prevent decomposition, and at the same time render them tough, supple, and insoluble and unalterable in water. Technically, a distinction is made between the "hides" of horses, oxen, and other large animals, and the "skins" of calves, sheep, goats, etc. The various kinds of animal skin used for leather are composed of dense bunches of a fibrous gelatinous material called collagen, the intervals

between which are filled with an albuminoid substance termed corrin. When brought into contact with tannin (q.v.) (for which may be substituted a mineral salt) the collagen and corrin combine with the tannin and become the insoluble and unalterable compound known as tanno-gelatin. A large proportion of the skin is furnished by animals slaughtered at home for other purposes, the ox being the most important. Ox-hides, either wet or dry salted, or merely dried, are imported in great quantities from Australia, the Cape of Good Hope, South America, and other parts of the world. East India furnishes an abundant supply of the small hides called "kips," which are already salted and tanned when they reach England. In addition to the large number of sheepskins produced at home, they are brought to England from abroad, especially from Australia, New Zealand, the Cape, and Buenos Ayres. Other important skins are the buffalo-hides from the East Indies, the Malay Peninsula, and Java, the horse-hides of South America, the goat-skins and kid-skins of Asia Minor, the East Indies, and the Cape, and the sealskins from Greenland and Newfoundland.

The most important of the processes by which leather is produced is that known as *tanning*. Before the tanning commences, it is necessary to unhair and flesh the hides, which are then hung or laid one above the other in a pit containing tan liquor or "ooze." The most important ingredient in this solution is the bark of the oak, which furnishes the safest and most valuable kind of tannin; owing, however, to the length of time required when the process is carried on by means of oak tannin alone, recourse is now usually had to more powerful agents also, *e.g.* the bark of the hemlock, birch, and mimosa, nutgalls, and the powdered leaves and young shoots of the sumac. Strong preparations should, however, be used with caution, as they tend to render the leather hard and inflexible. During the earlier stages of the tanning especially, it is necessary that the ooze should be weak, stronger liquor being used in each of the successive baths in which the skin is placed. At first the skins are shifted or turned over twice or oftener in the course of a day; but they are afterwards allowed to lie for a longer time, and finally remain in the same pit for several weeks, with raw bark placed between the layers. They are then piled up under a covering which keeps off the light, and drained; the process of drying is completed by hanging them in a loft. The final stages of tanning consist of damping, scouring, oiling, smoothing by means of a "striking-pin," and rolling over a smooth surface. The skin is then handed over to the currier, by whom it is subjected to a number of finishing operations, the most important being the "stuffing," which is effected by softening the skin in water, and then allowing the water to evaporate, so as to admit a mixture of tallow and cod-oil, which has been previously applied to the surface.

The process called *tawing*, usually employed in the preparation of furriers' skins and the manufacture of glove leather and the uppers of ladies' boots, differs considerably, according to the skin used, but it bears a general resemblance to tanning,

excepting that mineral salts, such as common salt, alum, or iron salts are used instead of tannin. In *shamoying* some fatty substance such as fish-oil is gradually worked into the skin by means of stocks, and unites with the collagen and corrin to form a soft and spongy material; originally the skin of the Alpine chamois was employed for this purpose (whence the name), but most shamoy-leather is now made from sheepskins. Continuous rubbing, working, and stretching are essential features both of tawing and shamoying.

Some of the best-known kinds of leather are *morocco*, a dyed and grained leather, originally prepared by tanning goatskins in sumac, but now often made of split sheepskins or calfskins; *roan*, a sheepskin leather which resembles morocco, excepting that it is smooth instead of grained; and *russia* leather, any thin, smooth leather in the preparation of which the oil of birch-bark is employed.

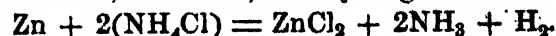
Lebanon, a mountain range of Syria, to the north of Palestine, stretching from lat. 33° to 34° N. The name signifies "White," this characteristic proceeding from the whitish colour of the limestone and chalk composing the mountains. The range consists of the two almost parallel ranges from N. to S. of Lebanon on the W., and Anti-Lebanus on the E., enclosing the Buka, a valley which narrows towards the S. This valley is watered by two rivers which rise near each other, the El-Asi (ancient Orontes) flowing N., and the Litany, flowing S. and then W., and there are numerous streams between the different mountain spurs. The line of geological cleavage is, generally speaking, from N. to S., and there are traces of volcanic and of glacial action. The spurs generally trend E. and W., but there are some parallel to the general direction of the chain. The west of Lebanon slopes to the sea, and the margin between mountain and coast is often very narrow, and this western region has the ordinary trees, shrubs, etc., of the neighbouring parts of Syria. The eastern part is barren, save for a few plants and coarse brushwood. The mountain region bears dwarf oaks, and then, higher, tall pines, till in a belt from 4,000 to 6,000 feet occur the cypress and the noted cedar of Lebanon. The south parts generally are more fertile than the N., and the W. than the E. The chief heights, which, however, are not abrupt, are in the N. Zahr el Kazib is 10,000 feet high, the pass from Baalbec to Tripoli 8,351 feet, that of the French route from Beyrout to Damascus 4,700, and the pass to Sidon 6,000. Sunnim, visible from Beyrout, is about 9,000 feet high. The population are chiefly Syrian, their numerical order being Maronites, Orthodox Greeks, Druses, and Mohammedans. Since the religious outbreaks of 1860 the province of Lebanon Proper, 87 square miles in extent, has been administered by a Christian governor, appointed through European intervention. The people are a fine race, fond of gay colours, and practise tattooing. They employ themselves in cattle-breeding, in cultivating the walnut, olive, mulberry, vine (for home use), wheat, barley, sorghum, and tobacco; coal, bitumen, and petroleum are found.

Le Brun, CHARLES (1619-90), French painter, was born at Paris, and at the age of 15 attracted the notice of Poussin by his work. The two went to Rome together in 1642, and Le Brun remained there for four years. He then returned to Paris. He was the moving spirit in the establishment of the Academy of Painting and Sculpture, the French Academy at Rome, and the Gobelins. In 1660 his designs for decorations at the king's triumphal entry pleased Louis, and his *Alexander and the Family of Darius* obtained for him nobility, a pension, and the post of royal painter. He decorated Versailles and the Louvre, but the death of Colbert put him in the shade, and he died neglected.

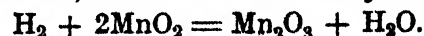
Lecky, WILLIAM EDWARD, was born near Dublin in 1838, and graduated at Trinity College, Dublin, in 1859. His first notable work was a series of sketches of Swift, Flood, Grattan, and O'Connell, as leaders of public opinion in Ireland (1861); but his reputation chiefly rests upon his *History of the Rise and Influence of the Spirit of Rationalism in Europe* (1865), and his *History of European Morals from Augustus to Charlemagne* (1869). In 1878-90 he produced a *History of England in the 18th Century*, and in 1899 a series of essays under the title *The Map of Life*. In 1895 he was elected member for Dublin University. He died in 1903.

Leclaire, EDMÉ JEAN (1801-72), a French capitalist and experimentalist in the region of union of capital and labour. He began life as a farm-labourer, but came to Paris as a painter's apprentice, and by his energy won a good position. He seems to have had the good of the working men at heart, and his system of profit-sharing (q.v.), which began in 1842, has had important results.

Leclanché Cell is a form of primary battery extensively used for ringing bells and similar purposes. A square glass jar contains a zinc rod and a carbon plate in a solution of ammonium chloride. The carbon plate is in a porous pot packed with a mixture of equal bulks of coarsely-powdered retort carbon and manganese dioxide. The porous pot is sealed at the top with pitch or wax, and a lead cap, cast on to the carbon plate, serves for the attachment of a binding-screw. The zinc is dissolved in the ammonium chloride, forming zinc chloride, ammonia, and hydrogen:—



Polarisation is reduced by the action of the manganese dioxide, which oxidises the hydrogen:—



The current soon falls off if the circuit is closed for more than a few minutes, but the cell quickly recovers itself. The manganese and carbon powders are sometimes formed by compressor into *agglomerate* blocks, two of which are held in contact with the carbon plate by rubber bands thus rendering the porous pot unnecessary and reducing the resistance of the cell.

Lecoute de Lisle, French poet and man of letters, was born in 1818 in the Isle of Réunion. After travelling he adopted a literary life at Paris and gave all his sympathies to Greek and Eastern

Ledru-Rollin, ALEXANDRE AUGUSTE (1807-74), a French politician and revolutionist, was born and educated at Paris, where he was called to the bar. After the revolution of 1830 he pleaded the causes of defendants in political trials, wrote political tracts, and edited republican newspapers, and in the years preceding the movement of 1848 gained the title of "Tribune of the Revolution." Elected deputy in 1841, he advocated liberty of labour and universal suffrage. Under the provisional government he was Minister of the Interior, but lost his former influence. In 1849 his determined opposition to Louis Napoleon caused him to leave France and settle in London, where he joined the Revolutionary Committee of Europe and wrote a book on the *Décadence de l'Angleterre*. In 1870 he returned to Paris, but would not sit till 1874. His works were published in 1879.

Lee, that quarter towards which the wind blows; the side sheltered from the wind. A ship is said to be on a lee shore when she is near the land with the wind blowing right upon it. A lee-board is a strong frame of planking affixed to the side of a shallow-draught vessel, such as a river-barge, and capable of being let down into the water when the craft is close-hauled. It tends to prevent her from falling to leeward, and has the same effect as a centre-board.

Lee, ROBERT EDWARD (1807-70), a noted Confederate general in the American War of Secession, was born in Westmoreland county, Virginia, his father having been a general in the War of Independence and afterwards Governor of Virginia. The son was at West Point 1825-29, and then joined the Engineers. He was captain under General Scott in the Mexican War, and the siege of Chapultepec brought him a brevet colonelcy. In 1852 he was president of West Point, and in 1855 was lieutenant-colonel of the 2nd Cavalry in Texas. In 1861 he was colonel of the 1st Cavalry, but at the beginning of the troubles resigned his position in the U.S. army, and was appointed head of the Virginian forces, and was one of the five generals chosen by the Confederate Congress. In 1862 he commanded the army of North Virginia, and forced McLellan to abandon the siege of Richmond, crossed the Rapidan, defeated Pope, and invaded Maryland, but had to recross the Potomac, and in December he defeated the Federal forces near Fredericksburg. In the spring of 1863 he forced them again to retreat, but after the battle of Gettysburg was himself forced to retire into Virginia. The year 1864, when Grant crossed the Rapidan, saw the beginning of the end, and in April Lee, seeing there was no further hope of combating the resources of the Northerners, surrendered

three horny jaws with finely-serrated edges, which in cutting through the skin are used like saws, producing a wound which bleeds freely, but heals quickly. Another species is the Horse-leech, common in ponds in Britain.

Leech, JOHN (1817-64), English draughtsman and humorist, was born in London and educated at Charterhouse, where he was the contemporary of Thackeray. He early displayed skill as a caricaturist, and when he betook himself to the study of medicine at St. Bartholomew's Hospital he was noted for the excellence of his anatomical drawings. He published a set of *Etchings and Sketchings* at the age of 18, and in 1838 he was at work on *Bell's Life*. In 1841 he made his appearance in *Punch*, and remained for life a member of its staff. His cartoons and his plates illustrative of various phases of social life are well known to all readers of *Punch*. He also worked for *Once a Week*, *The Illustrated London News*, Hood's *Comic Annual*, Charles Dickens's *Comic Histories*, the *Handley Cross* series of sporting novels, and the *Bon Gaultier Ballads*.

Leeds, the most populous of Yorkshire towns, municipal and parliamentary (5 members) city, is situated upon the Aire in the N.W. of the West Riding of Yorks, 25 miles S.W. of York, and 196 N.W. of London. It is the great centre of the British woollen trade, very many hands being employed in the ready-made clothing trade, and the woollen industries employing great numbers both in the city and in the surrounding towns and villages. Business to the amount of several millions a year is transacted in these branches, and of late years the iron and engineering trades have been largely developed. The city has also large tanneries and boot factories, and other industries are locomotive- and machine-building, colour and other printing works, chemical, worsted, and earthenware works. There are three markets, and among the principal buildings are the church of St. Peter, Kirkgate, with a tower 139 feet high, the "Laudian" church of St. John (1634), a fine town hall with large organ, municipal buildings, grammar school, royal exchange, stock exchange, and Yorkshire college established in 1874. There are five railway stations, and the city is traversed by tramways, on most of which handsome electric cars are run. Roundhay Park is a recreation ground, and a fine view is to be had from Woodhouse Moor, which has also been planted with trees. Kirkstall Abbey is about three miles away. Among the names connected with Leeds are those of Dr. Priestley, who founded a library, and Dr. Hook, who was an energetic vicar. Pop. (1908), 477,107.

2. A prettily-situated village in Kent, upon the

Len, noted for its fine moated castle of great anti-quarian and historical interest.

Leeds, DUKE OF, THOMAS OSBORNE (1631-1712), was the son of a Yorkshire baronet. In 1661 he became M.P. for York, and was a staunch upholder of Church and king. His principles brought him preferment and the favour of the king, and in 1674 he was made Lord High Treasurer and Earl of Danby. He acted as a go-between to Charles II. and Louis XIV., and in 1678 was impeached on this account by the Commons, who kept him in the Tower till 1683, notwithstanding the king's pardon. Not in favour with James II., he joined in inviting William III., and was made Marquis of Carmarthen and President of the Council, being in 1694 advanced to the Dukedom of Leeds. The next year he was again impeached for taking bribes, and in 1699 retired from public life, though he appeared again in 1710 to speak in defence of Dr. Sacheverel.

Leek (*Allium Porrum*), an esculent plant, closely allied to the onion, probably of Eastern origin, and recorded as cultivated in ancient Egypt. It has long been cultivated in England, and more extensively in Wales and Scotland, the whole of the plant above ground being employed in stews and soups. In France the stems are blanched by being earthed up. The leek is the badge of Welshmen, St. David having directed them to wear it in a battle with the Saxons, in the 6th century, in which they were victorious.

Leeuwarden, capital of Friesland, in Holland, is an inland town 17 miles from Haarlem, and 32 miles W. of Groningen. It has good railway and canal communication with each of those towns, and is in a prosperous condition. Its tasteful parks, pleasure-grounds, and drives have gained for it the name of the "Frisian Hague." Among its buildings are the Church of the Jacobins, where the Frisian Stadtholders were formerly buried; an 18th-century town-house, with valuable archives; a 16th-century weigh-house; a palace; and a brick house of 1502. There is a trade in timber, fruit, cattle, and boat-building, iron-founding, copper- and lead-working, and sewing-machines, safes, organs, and tobacco are manufactured.

Leeuwenhoek, ANTON VAN (1632-73), a noted microscopist, was born at Delft. His practice as a glass-grinder led him to see the advantage of employing a single lens of short focus in microscopic work. In 1673 he was introduced by De Graaf to the Royal Society, and gave an account of his views in their *Transactions*, and in 1680 he was made a fellow. Among his many discoveries, perhaps the most important was that of capillary circulation, which he demonstrated on various animals, and the different shapes of blood discs. He also strongly advocated the theory "*omne vivum ex ovo*" in opposition to the supporters of the theory of spontaneous generation. He made discoveries, too, relating to the teeth, the lens of the eye, the epidermis, spermatozoa, scales on insects' wings, spiders, fleas, trees, and plants. The most complete edition of his works was published at Leyden (1719-22).

Leg. The leg is divided into the thigh, the leg proper, ankle, and foot. The bone of the thigh is called the femur, those of the leg are the tibia and fibula. The bones of the ANKLE and FOOT are described under those heads. The great muscles of the calf are the gastrocnemius and soleus; they are inserted by means of the tendo Achillis, the largest tendon in the body, into the prominence of the os calcis. The chief muscles of the front of the leg are the peronei muscles on the outer side, the extensor muscles of the toes, and the tibialis anticus. A considerable extent of the anterior surface of the tibia is uncovered by muscles, and lies immediately beneath the skin. The shin bone, as it is called, is thus particularly liable to injury. The chief arteries of the leg are the anterior and posterior tibial arteries, which result from the division of the popliteal artery, which is the continuation of the great artery of the thigh. Artificial legs are frequently used, when a person has suffered amputation. Wood, vulcanite, gutta-percha, etc., are all employed, but the so-called *cork legs* are usually made of willow wood.

Legacy, a gift or bequest of goods and chattels by will. The person to whom it is given is termed the legatee. The bequest requires the assent of the executor or administrator to the will annexed as the case may be; but before such assent, the bequest is transmissible to the personal representatives of the legatee, and will pass by his will. The executor or administrator is not bound to admit that there is anything due to the legatee till the deceased's debts and expenses attending the administration of the estate are discharged. Legacies are of two kinds, general and specific. A general legacy is when it is so given as not to amount to a bequest of a particular thing or a particular fund of the testator. A specific legacy is a bequest of a specified thing, or a specific part of the testator's estate. There is also a third description of legacy partaking somewhat of the nature of both kinds already mentioned, as a gift of so much money with reference to a particular fund for payment. This is called a *demonstrative* legacy, but it so far differs from one properly specific that, if the fund pointed out fails on any account, the legatee will be paid out of the general assets. It may be stated as a general rule that legacies are payable twelve months after the death of the testator, and with interest from that time at 4 per cent. unless the testator has made some special provision as to the time of payment and interest. When a specific legacy consists of some certain chattel, whether real as a lease for years, or personal, as a particular house, the legatee after assent by the executor to the legacy may take possession of it or sue for it by action at law; but where the specific legacy consists of money, etc., and in all cases of general and demonstrative legacies, the action at law lies unless the executor has for some new consideration beneficial to himself expressly promised payment. As a general rule, therefore, it may be stated that the remedies of legatees against law are the subject of administration in the Courts of Equity. Legacies

pay a duty unless they be expressly given free of claim, in which case the deceased's estate pays it. A stranger in blood pays 10 per cent., nephews and nieces 3 per cent., uncles and aunts of the deceased 5 per cent., children 1 per cent. Legacies to a wife by her husband, or to a husband by his wife, are free of duty. [See DEATH DUTIES.]

Legate, a messenger or ambassador sent by the Pope to any country. They are of three kinds. (1) *Legati a latere*, "from the side" of the Pope, who are always cardinals, with authority almost equal to that of the Pope himself. (2) *Legati missi* or "apostolic nuncios," sent with absolute authority on some special mission. (3) *Legati nati*, who were supposed to exercise the legatine power in consequence of the office they held. From the reign of Henry I. the Archbishops of Canterbury were commonly regarded as *legati nati*, but their authority was frequently superseded by that of *legati a latere* and *legati missi*. In England, as in other countries, strenuous resistance was offered to the claim of the Papal legates to exercise an ecclesiastical jurisdiction independent of the civil ruler, as representatives of a higher spiritual power. The Statute of Præmunire (1393) by denying the authority of any tribunal outside the realm made it illegal to act as legate.

Legendre, ADRIEN MARIE (1752-1833), a French mathematician, contemporary of Laplace and Lagrange, was born at Paris, where he studied at the Collège Mazarin. In 1744 he contributed to his tutor's *Traité de Mécanique*. He was appointed professor of the École Militaire, and then of the École Normale, and in 1782 he obtained a prize from the Berlin Academy for a *Dissertation sur la Question de Balistique*. The next year he published *Recherches sur la Figure des Planètes*. Later he was appointed one of the commissioners for connecting Paris and Greenwich by triangulation, and was one of those employed to work out the details of the metrical system introduced by the Revolution, and to determine the length of the metre. He also published *Elements of Geometry*, and made discoveries in integral calculus, the method of least squares, and elliptic functions.

Leghorn (LIVORNO), chief town of the province of Leghorn on the west coast of Italy, and next in commercial importance to Genoa and Naples. It is 15 miles by railway from Pisa, and stands on low ground backed by a ridge of hills, one of which is Monte Nero topped by an ancient monastery. Within the walls are broad streets of large houses with extensive squares, and outside are suburban villas. There are some fine statues, and among the chief buildings are a cathedral, with façade by Inigo Jones, a town hall, oil warehouses built by Cosmo III. in 1705, subterranean reservoirs, and a Jewish synagogue almost rivalling that of Amsterdam. In the disused Protestant cemetery Smollett was buried. There is an "old port," protected from all winds, and having docks to the S. and E., and communicating with a network of canals—one reaching to the Arno—which have led to part of the city being called "Little Venice." The new port is protected by a breakwater

a mile and a quarter from shore, and further improvements have been made with a view to protecting it from the S. winds. Vessels moored to the breakwater are in safety. The principal trade is with Great Britain, France, and the United States, and there is a rapidly-increasing coasting-trade. Ship-building and the manufacture of coral ornaments are important industries, the latter employing many women. Among the exports, which approach £200,000 in value, are wine, silk, marble, oil, hemp, fruit, leather, coral, and hats.

Legion, a constituent part of the ancient Roman army, the organisation of which differed in different epochs. During the republican period it contained 4,500 men—viz. 1,200 *hastati*, 1,200 *principes*, 600 *triarii*, 1,200 *velites* (skirmishers), and 300 *equites* (cavalry), recruited from the richer class. The *velites* were the "youngest and poorest," the *hastati* "those next them," the *principes* the "most vigorous in years," the *triarii* the "oldest." The *hastati*, *principes*, and *triarii* formed three lines, ranged one behind the other in the order named. Each line contained 10 maniples, consisting in the first two of 120, in the third of 60 men apiece. The officer commanding a maniple was called a centurion. To every legion were attached six "military tribunes," who took the command in rotation, each for two months. Under Marius the three lines were amalgamated, and the whole legion divided into 10 cohorts, each containing 3 maniples. During the civil wars the tribunes were replaced by a permanent commander called a *legatus*. Under the early Empire the total number of men was raised to 6,000, exclusive of cavalry and *velites*. Various other changes were subsequently introduced.

Legion of Honour, an order of merit founded by Napoleon I. in 1802. All citizens were eligible, no regard being paid to differences of birth or social position. On their admission members took a solemn oath that they would do all in their power to uphold the republican institutions of France. The order has been several times remodelled since its first institution. It now comprises five classes—viz. grand crosses, grand officers, commanders, officers, and chevaliers or knights, the total number of members being upwards of 30,000. Excepting in time of war, 25 years' public service is an indispensable qualification, and, in the case of three-fifths of the members, this must have been of a military or naval character. At present the decoration is a white enamelled star of five rays, bearing on the obverse a figure representing the Republic and the words "République Française, 1870," on the reverse, two tricolor flags with the motto "Honneur et Patrie;" the ribbon is of watered scarlet silk.

Legume, the fruit characteristic of the order Leguminosæ (q.v.), formed from one superior carpel, with a pericarp that becomes dry in ripening, bears one row of ovules down its ventral suture, and splits down both sutures into two valves. It sometimes does this with some violence, so as to discharge the seeds, as in the furze. In some genera there are transverse septa between the seeds, as in

Cassia Fistula, and in *Astragalus* a longitudinal partition.

Legumin is an albuminoid substance which occurs largely in the seeds of leguminous plants as lentils, peas, haricot beans, etc., in sweet and bitter almonds and other sources. Its exact composition is unknown, and but little of its properties certainly determined. It appears to be almost identical with *Casein* (q.v.), and is also known by the name of *vegetable casein*. It is best obtained from an extract of peas and by precipitation by acids appears as a flocculent powder soluble in cold water, precipitated by acids, but redissolved by excess and coagulable by heat.

Leguminosæ, a large natural order of dicotyledonous plants, comprising some 7,000 species in about 550 genera. They occur in all parts of the globe; but are specially abundant in the tropics. Including plants of all sizes, the order—one of the first recognised as natural—agrees in having scattered, stipulate leaves, generally compound; an inferior calyx of five united sepals, of which the odd one is anterior—thus differing from that of the *Rosaceæ* (q.v.)—five free perigynous petals; stamens ten, and monadelphous or diadelphous, or indefinite in number and free; and almost always a single superior many-seeded carpel which forms a legume (q.v.), and contains exalbuminous seeds with large cotyledons. The order is divided into three sub-orders: the *Papilionaceæ*, to which all British, and most European, members of the order belong, named from its butterfly-like corolla (q.v.), with one large posterior petal or *standard*, two lateral or *wing* petals, and two, sometimes united, *keel* petals, and ten stamens; the *Cæsalpinieæ*, with monosymmetric but not papilionaceous corollas and ten stamens; and the *Mimoseæ*, with polysymmetric flowers having valvate petals and an indefinite number of stamens. No order except the grasses, and perhaps the palms, is so useful to man. Besides some valuable timbers and fibres, it yields such important dyes as indigo (q.v.) and logwood (q.v.); the chief gums, including gum-arabic, gum-tragacanth and wattle-gums; such fodder plants as clover, lucerne, and sainfoin; and, most useful of all, the pulses, peas, beans, lentils, etc., so rich in nitrogenous matter. The order is, in fact, often spoken of as the pea and bean tribe. Several members of the order are poisonous, especially in their seeds, as the laburnum (q.v.), and the Calabar or ordeal bean (*Physostigma venenosum*).

Leibnitz, GOTTFRIED WILHELM (1646-1716), the great philosopher, mathematician, and man of business, was born at Leipzig. His father died when the son was six years old, and from that time the boy educated himself. He was fond of history, learnt Latin, and then taught himself Greek and logic. In 1661, as a law-student at Leipzig, he studied the new methods of logic which were ousting the scholastic theories, and in 1663 he began to study mathematics. Failing to get a degree on account of his youth, he left Leipzig, and obtained employment at Mainz, where he studied alchemy, and became secretary to the Rosicrucians,

whose theories he examined. The danger that befell Germany of invasion by France led to his publishing *Thoughts on Public Safety* (1670), in which he suggested the scheme of France taking Egypt, a scheme which slumbered till revived by Napoleon in 1803. This led to his going to Paris, from which he removed to Amsterdam, and made the acquaintance of Spinoza. He then for many years took charge of the Duke of Brunswick's library at Hanover. From 1712-14 he was at Vienna. He made a calculating-machine, and his investigations in mathematics resulted in the discovery of differential and integral calculus. His chief philosophical works are the *Monadologie* (1714), *Nouveaux Essais* (dialogues on Locke's system), and the *Théodicée* (1710), an attempt to uphold the argument from design in nature. He also wrote much on history and jurisprudence.

Leicester, the county town of Leicestershire, is a municipal, parliamentary, and county borough on the Soar, a tributary of the Trent, 22 miles S.E. of Nottingham, and 20 N.E. of Rugby. It returns two members to Parliament, and has sent two since the time of Edward I. Its central position, its three railways, and facility of water transit, have led to great commercial activity, the great industries being hosiery-making, the manufacture of pegged and riveted boots and shoes, iron-founding, and the manufacture of elastic webbing, sewing-cotton, and lace. There are several good churches, that of St. Martin having a spire 218 feet high, an old town hall with 15th-century carving and glass, municipal buildings, corn exchange, museum, opera house, school of art, and Wyggeston Hospital Schools, originally founded 1513. The Victoria Park, Abbey Public Park, and Spring Hill Park are recreation grounds, and the New Walk is shaded by trees. Leicester is of great antiquity, and is said to be the Roman *Ratae*, many remains of pavements, bricks, urns, etc., having been found. There are traces of the Norman castle, dismantled by Charles I., and the ruined 12th-century Abbey was the place of Wolsey's death. At the Blue Boar Inn Richard III. slept the night before his death. A memorial tower commemorates Simon de Montfort and other worthies, and there is a statue of Robert Hall. Pop. (1908), 240,172.

Leicester, ROBERT DUDLEY, EARL OF (1531-88), was the grandson of one of Henry VII.'s agents and extorters. This grandfather was beheaded by Henry VIII., but his son almost succeeded in diverting the succession to the crown at Edward VI.'s death, though his designs led to his own execution and that of his son Guildford. Robert also was committed to the Tower, and was condemned to death, but received the queen's pardon, and was made Master of the Ordnance. He became Master of the Horse to Queen Elizabeth, and the hopes founded on this appointment are said by some to have led to the death in 1560 of the ill-fated Countess Amy, whom Scott has immortalised. He was made K.G., and the queen gave him Kenilworth Castle, where later (1575) she visited him, and lands in Warwick and Wales. In 1564 he was made Earl of Leicester, and in 1578 he married

the widow of the Earl of Essex. In 1585 his expedition to Flushing caused Elizabeth to take offence at the honours paid him by the States-General; but after his recall we find him appointed Lieutenant-General of the army at Tilbury in the last year of his life.

Leighton, FREDERICK, LORD, P.R.A., was born (1830) at Scarborough. He first exhibited at the Royal Academy in 1855 *Cimabue's Madonna carried in Procession at Florence*. His *Paolo and Francesca* and *The Sea giving up her Dead* are well known. Lord Leighton was also a sculptor of merit. He became A.R.A. 1864, P.R.A. and knight 1878, baronet 1886, and peer in 1896. In the same year he died.

Leighton, ROBERT (1822-69), a Scottish poet, was born at Dundee, and spent his early youth on a farm, going from there to his brother's office at Dundee, and sailing in 1842 round the world as a supercargo in one of his brother's ships. He then became traveller for a Liverpool firm. His chief works are *Ye Three Voyces*, *Poems by Robin*, *Baptisement of the Bairn*, *A Laddie's Lamentation*, and *Reuben and other Poems*.

Leinster, the south-eastern of the four provinces into which Ireland is divided.

Leipzig, the second commercial city of Germany, and a great literary and artistic centre, is in a fertile plain of Saxony, above the junction of the Pleisse, Parthe, and Elster, 64 miles N.W. of Dresden, and 6 miles from the Prussian frontier. It consists of the old city, the ancient fortifications of which are now marked by boulevards, and the outlying suburbs and villages. The old town is picturesque in its buildings, among them being the Rathhaus (1556), the Fürstenhaus, the Pleissenburg (16th century), Auerbach's Keller, a wine vault with 16th-century wall-paintings illustrating the story of Faust, the Augusteum (now part of the university), the Paulinum (a monastic building, now the university library), the theatre, and the museum. Leipzig contains the supreme courts of the empire, the second largest university, and is the centre of the book-trade of Germany, the publishers and booksellers having their own clearing-house. One of the chief features of the town is its three great fairs, where business to the amount of £10,000,000 is done, chiefly in furs, leather, hides, wool, cloth, linen, and glass. Beyond perfumery and artificial flower-making, and some founding of type, etc., there are few industries. Leipzig (*lip*, "a lime"), grew into importance in the latter part of the 12th century, and suffered much in the Thirty and the Seven Years' Wars. The last battle fought there was that of 1813 with Napoleon. Leibnitz and Wagner were natives of Leipzig.

Leith, seaport, municipal and parliamentary borough of Scotland, on the south shore of the Firth of Forth, 2 miles N. of Edinburgh, at the mouth of the Water of Leith, and is $3\frac{1}{2}$ miles from E. to W. It is divided into North and South Leith by the water, which is crossed by seven bridges. There are a few fair buildings, and the harbour works have been extensively carried out, there being now

40 acres of docks, seven graving docks, and two piers. Steam communication with London, the North, the Continent, and New York, gives rise to a large export and import trade. The industries are shipbuilding, sugar-refining, brewing, distilling, etc. Pop. (1901), 76,667.

Leitrim, a maritime county in Connaught, between Donegal Bay on the N.W., Fermanagh N.E., Cavan E., Longford S.E., Roscommon and Sligo S.W. It is of an hour-glass shape, and the centre is occupied by Lough Allan. The county is 52 miles long, and contains 588 square miles. In the north is a high tableland reaching to 1,485 feet in Lugnaquilla. The south is wooded and more level. The rivers are the Shannon (flowing S.W. and forming part of the boundary), the Bonnet, Bundrow, and the Bunduff. Other loughs are Maclean, Scur, Gill, and Melvin, and a canal leads from Carrick-on-Shannon to Lough Erne. The central part is in the Connaught coal-field, and ironstone, lead, copper, manganese, and yellow ochre are found; and there are also sulphur and chalybeate springs. Some coarse linens, woollens, and pottery are manufactured. The county returns two members to Parliament, and the capital is Carrick-on-Shannon. Pop. (1901), 69,201.

Lek (LAK), a widespread nomad people of West Persia, chiefly in the provinces of Fars and Mazanderan, and in Kasvin district, traditionally descended from the Kaianian Persian dynasty, but really a branch of the Luri (Kurdish) race. All are Mohammedans, though the so-called Nasari form a distinct sect, which rejects the supremacy of the prophet. The famous military bands of the Kelhors and Gurans, at one time commanded by Sir Henry Rawlinson, are Leks, of whom the other chief divisions are the Beiranavands, Khojavands, Nadavands, Nakavands, and Jalilavands, with total population about 110,000.

Leland, JOHN (16th century), English antiquary, was born in London, and was educated at St. Paul's under Lily. He then went to Christ's College, Cambridge, and to All Souls' College, Oxford, and, after a visit to Paris, became chaplain to Henry VIII. The king, in 1530, made him rector of a parish near Calais, and in 1533 appointed him king's antiquary with power of search. For six years he travelled to collect materials, and in 1542 was made rector of Haseley, in Oxfordshire, and the next year Canon of Christ Church and Prebendary of Salisbury. He afterwards went to London, and in 1547 became insane. Most of his collection is in the Bodleian or the British Museum, and later writers have consulted him with advantage.

Lely, PETER, SIR (1617-80), painter, was born in Westphalia. His name Lely is said to be derived from a nickname of his father. After studying two years at Haarlem, he in 1641 came to England, where at first he tried historical subjects and landscapes. He then took to portraits, Charles I. and Cromwell being among his earlier sitters. At the Restoration he was knighted and made State painter. He took for his model Vandyk,

and among his works are the Hampton Court series of *Ladies of Charles II.'s Court*, *Susannah and the Elders*, *Jupiter and Europa*. He also did crayon work. He died and was buried at Covent Garden.

Lemberg, or LÖWENBURG, the capital of the Austrian province of Galicia, is 180 miles E. of Cracow and 60 from the Russian frontier. It is in a hollow 1,000 feet above sea-level on a tributary of the Bug, which flows into the Vistula. The Castle Hill is 1,300 feet high. The site of the old walls is now boulevards, and the suburbs extend over 12 square miles. The Roman Catholics, Greek Catholics, and the Armenians have cathedrals, and there is a Dominican church containing a monument by Thorwaldsen. Besides a university, there is a fine library and good scientific and antiquarian collections. The inhabitants are Poles, Germans, and Ruthenians. Among the productions are flour, beer, vinegar, oil of roses, matches, machinery, and earthenware. Lemberg has often been besieged.

Lemet, a large nation of North Siam, chiefly in the Nam-Ta Valley, left bank of the Mekhong, between lat. 20° and 21° N. They were formerly subject for the most part to the Siamese Governor of Luang-Prabang; but since the rectification of frontiers in 1893 they have passed under French jurisdiction. The language differs greatly from Siamese, and appears to be more nearly allied to Anamese; it is uncultivated, and the Lemets themselves have been little affected by the general Buddhist culture of Indo-China. (Capt. Forbes, *The Languages of Further India*, p. 90.)

Lemnos, in the north of the Ægean Sea, is an island belonging to Turkey, and is about equidistant (40 miles) from Athos and from the Dardanelles. It contains 150 square miles, and much of it is mountainous, though there are fertile valleys, which are cultivated by means of oxen. There are no forests, and wood has to be imported, but the mulberry and other fruit-trees are cultivated, and on the hill-sides thousands of sheep are pastured. The chief productions are corn, wine, and cattle. The archbishop resides at Kastro, which is on the west coast, has a good harbour, and is the seat of trade which is carried on by Greeks, of whom the inhabitants are mostly composed. Another town is Mudros in the south. A peculiarity of Lemnos is a kind of medicinal earth, which is gathered at certain times and in certain quantities with much solemnity. Lemnos was celebrated in Greek history and legend, and was sacred to Hephæstus. After the fall of the Byzantine Empire it belonged to the Turks, Venetians, and again it fell to Turkey in 1657.

Lemming (*Myodes*), a genus of mouse-like Rodents, with four species from Scandinavia, Siberia, and arctic and sub-arctic America. They are allied to the vole (q.v.), but are more stoutly built. The Scandinavian (*M. lemmus*), about 5 inches long, with brownish-yellow fur spotted with black, migrates periodically in vast troops, which go east or west from the central plateau till they reach the sea, into which they plunge with the vain expectation of crossing it, as they have

already crossed the lakes and rivers that lay in their course. The Banded Lemming (*Caniculus torquatus*), the sole species of the genus, has no external ears.

Lemon (*Citrus Limonum*), a fruit-bearing shrub closely related to the orange (q.v.), apparently truly indigenous in the north of India, carried to Palestine and Egypt by the Arabs, and to Italy by the Crusaders, and now naturalised in the West Indies. The fruit is oval, or ovate, and ends in a nipple-like point; the rind is thin, smooth, and not readily separable; and the juice is acid. There are numerous varieties. Lemons and lemon-juice are imported from Sicily and other parts of southern Europe, the fruits being in cases 4 feet long and about a foot wide and deep, containing 500 lemons, whilst the juice is in casks. One thousand five hundred lemons yield 26 gallons of raw juice; but it takes 2,500 to yield that quantity of concentrated juice. Five per cent. of alcohol may be added as a preservative. Besides their use fresh and candied and in making lemonade, lemons are used in the manufacture of citric acid.

Lemon, ESSENCE OF, is obtained from the rind of lemons, either by pressure or by distillation with water. It consists chiefly of a hydrocarbon of the same composition as oil of turpentine. It possesses an agreeable odour, and is used sometimes for imparting this odour to ointments, medicines, etc.

Lemon, SALTS OF, also called *salts of sorrel*, consist of an acid oxalate of potash, which occurs in the leaves of the wood-sorrel, from which it was formerly largely prepared, chiefly in the neighbourhood of the Black Forest. It forms transparent crystals, soluble in water, and possessing a sour taste. It may be used for taking out rust- or ink-stains from linen and such materials.

Lemonade, a beverage made by digestion of lemons with water and addition of sugar. The commercial lemonade, sold in bottles or siphons, is an aerated water—i.e. water charged under pressure with carbonic acid—sweetened with sugar, and flavoured either by the lemon juice, or by a little citric acid.

Lemur (Lat. = "a ghost"), a Linnæan genus of Primates, named from their nocturnal habits and the weird appearance of some of the species. The term is now applied to the type-genus, and popularly to any member of the sub-order Lemuroidea, some of which show affinities to the Insectivora (q.v.), as well as to the monkeys. Hence, the Germans call them *Halb-affen* (= "half-apes"), and some naturalists Prosimiæ. They are monkey-like animals of small size—mostly nocturnal and arboreal—feeding on fruits, varied with insects, birds' eggs, and small birds. Those of the type-genus, however, are active, diurnal, of gentle disposition, easily tamed, and amusing and affectionate pets. The geographical range of the group, from Malaysia to Madagascar and Africa, has led some naturalists to think that at one time there must have been land connection between these points, and for this hypothetical land Dr. Sclater proposed the name "Lemuria." This theory may probably

assume fresh importance owing to the paper read by Mr. H. O. Forbes before the Royal Geographical Society in March, 1893, as to a supposed former southern continent ("Antarctica"), which, he believes, included Lemuria. [AYE-AYE, GALAGO, LOBIS, TARSIER.]

Lemures, in Roman mythology the spirits of the departed. The good were supposed to become Lares (q.v.) and wicked Larvæ, with power to injure the living. On the nights of May 9, 11, and 13 ceremonies were performed to propitiate the Lemures or to check their power.

Lemuria. [LEMUR.]

Lenca, a large group of aborigines occupying parts of the Mosquito territory and Honduras, Central America. At present the term Lenca is applied indifferently to all the Honduras Indians, and thus comprises several tribes, such as the Toacas and Xicacs, who speak quite distinct languages. But all resemble each other in their physical traits, low stature, thick-set frames, robust constitution, and extraordinary staying power as carriers of heavy loads. The Xicacs are still in the wild state; but most of the others are Ladinos, semi-civilised half-breeds, claiming to be Catholics, though still practising many pagan rites and preserving their old patriarchal customs. The Payas (Poyas) of the Rio Negro and about Cape Cameron still dwell in huge barracks, 60 to 80 feet long by 30 feet deep, in which many families have each their own chambers all under one roof.

Lençlos, NINON DE (1615-1705), a celebrated French beauty, courtesan, and leader of society. The daughter of a gentleman of Touraine, she early began a life of licentiousness, and was a very general lover. As a society leader she was courted by Molière, La Rochefoucauld, Scarron, and others, and Christina of Sweden visited her. She long preserved her beauty, and there is a story that her grandson fell in love with her.

Lenguas, an Indian nation of Gran Chaco, South America, between the rivers Pilcomayo and Paraguay about the Bolivian and Paraguayan frontiers. The Lenguas, i.e. "Tongues," are so called by the Spaniards from the little tongue-shaped wooden or bone ornament which they insert in the lower lip, and which is worn in the same way as the wooden disk of the Brazilian Botocudos. They are a branch of the widespread Payagua-Guaycuru family, the true national name being *guiadga*. Formerly very powerful, this fine race of aborigines has been nearly exterminated during their long wars with the settled Hispano-American populations.

Lenni Lenâpe. [DELAWARE INDIANS.]

Lenormant, FRANÇOIS (1837-83), a French scholar and archæologist, was born at Paris, and in 1874 became Professor of Archæology at the *Bibliothèque Nationale*. He explored in Greece and Magna Græcia, discovered the Accadian element in the cuneiform inscriptions of Assyria, and made extensive researches in numismatics, the histories of the Bible, Egypt, and Assyria, and in

comparative philology. Among his works is one on the *Origines de l'Histoire d'après la Bible*. His early death was partly due to overwork, and partly to a wound received during the siege of Paris.

Lens is a part of any refracting substance, bounded by the surfaces of revolution, which are usually spherical. If the radius of a surface is infinite, that surface becomes plane. When a ray of light passes through a lens it is bent towards the thickest part; hence in convex lenses (which are thicker in the middle) the ray is made more convergent, and in concave lenses (which are thicker at the edges) the ray becomes more divergent. Convex or converging lenses may be either (1) double convex, formed by the intersection of two spheres whose centres are on opposite sides of the section; (2) plano-convex, formed by the intersection of a sphere and plane, really a particular case of (1) when one radius is infinite; (3) concavo-convex, formed by the intersection of two spheres whose centres are both on the same side. Concave or diverging lenses are also of three kinds:—(1) Double concave, being that portion of a medium which would be left between two spheres not cutting each other, their centres being on opposite sides of the lens; (2) plano-concave—the part between a non-intersecting sphere and plane; (3) convexo-concave, the part between two non-intersecting spheres, whose centres are on the same side, it being seen that the radius of the concave side must be not greater than the radius of the convex side. The axis of the lens is the axis of revolution, for both the surfaces and the centre of the lens is a point on this axis, such that when any refracted ray passes through it the incident and emergent rays are parallel. Light, incident upon a lens from any point P, is refracted to another point Q, such that the line PQ passes through the centre of the lens, and these two points are called conjugate foci. If P is at infinity, i.e. the incident rays are parallel, the point Q moves to a point F, which is called the *principal focus* of the lens, and the distance of F from the centre of the lens is called its *focal length*. The following equations show the relationships between the contents and variables of any lens, when its thickness is neglected:—

$$(1) \quad \frac{1}{v} - \frac{1}{u} = \frac{1}{f}$$

$$(2) \quad \frac{1}{v} - \frac{1}{u} = (\mu - 1) \left(\frac{1}{r} - \frac{1}{s} \right).$$

If O is the centre of the lens, then $u = OP$, $v = OQ$, $f = OF$, μ is the refractive index of the material of the lens, r is the radius of the surface which the incident light first meets, s is the radius of the second surface. Those lines are regarded as positive which are measured in a direction opposite to that of the incident light. The focal length is positive for concave, and negative for convex lenses. If a luminous object be placed at P an image of it will be formed at Q, and this image will be greater or smaller than the object, erect or inverted, according to the position of P. When the rays of light actually pass through the image, it is real and can be received upon a screen, but

when the rays do not actually pass through it, but only appear to come from it, that image is virtual and cannot be received upon a screen. With a concave lens the image is virtual, erect, smaller than, and on the same side of the lens as the object. OQ is always less than OP . With a convex lens a real inverted image is formed when the distance of the object from the lens is greater than the focal length, the image being smaller or larger than the object, according as the distance of the object is greater or less than twice the focal length; but a virtual, erect, and magnified image is formed when the distance of the object from the lens is less than the focal length; this is the case when a convex lens is used as an ordinary magnifying-glass. When the thickness of the lens is considered, the above formulæ become more complicated, and it is to be noted that in all simple treatment of lenses only those rays must be considered which are incident at, or near, the centre. The rays passing through the lens far from the centre do not converge to the same focus, and so spherical *aberration* occurs. When it is desired to obtain a very clear image of any object—as in photography—it is customary to prevent the entrance of rays near the edge of the lens by means of a stop, which only allows the ones nearly central to pass through. Since light of different wave-lengths is not refracted equally, an object viewed through a single lens appears coloured at the edges. This phenomenon is known as *chromatic aberration*, and was a great difficulty in the use of telescopes and other optical instruments, since definition was impossible. Newton considered the difficulty insurmountable, and this led him to use reflecting telescopes; but Hall discovered that it was possible to combine two or more lenses so that the chromatic aberration is almost completely eliminated. Such combinations or "*achromatic*" lenses are now used even in the cheapest optical instruments.

Lent (Anglo-Saxon = spring), a season of fasting and prayer extending over the forty weekdays which precede Easter. The early Christians observed a fast which lasted from the afternoon of Good Friday to the morning of Easter Day, and was hence known as *Quadragesima*, its duration being about 40 hours. Gradually other days were added, the number of which varied considerably in different churches, as also did the degree of severity with which the fast was kept. It was not till the pontificate of Gregory the Great that its length became fixed at forty days. The name "*Quadragesimal Fast*" probably contributed to this result, as well as the fact that this was the length of Our Lord's sojourn in the wilderness and of the period of probation imposed on Moses, Elijah, and others in the Old Testament. The Church of England now countenances considerable laxity in the observance of this fast.

Lenticel, a small lens-shaped gland on the under surface of a leaf.

Lentil (*Ervum lens*), a leguminous plant, closely related to the genus *Vicia*, the vetches, from which it differs chiefly in the narrow and nearly equal sepals in its calyx. It grows about

18 inches high, with a weak stem, climbing by means of the tendrils which terminate its pinnate leaves. These leaves have eight to twelve leaflets: the flowers are pale blue, and generally in pairs; and the pods are almost square, smooth, and one- or two-seeded. The chief varieties in cultivation are the *French*, in which the seeds are ash-grey, large and flat, and the *Egyptian*, in which they are smaller, rounder, darker outside and orange-coloured inside. The lentil was probably one of the first plants brought under cultivation (Genesis xxv.), and is still largely grown in the East, in Egypt, and in Southern and Central Europe. Considerable quantities are imported into England, chiefly from Egypt, for the manufacture of *Revallenta*, which is little more than lentil meal. The plant might, however, well be cultivated with us, its value as a nitrogenous food being very great. It contains 26 per cent. of albuminoid matter to 35 of starch, 7 of gum, 2 of sugar, 2 of fat, 12.5 of woody fibre, 1.5 of mineral matter, and 14 per cent. of water. If boiled for twenty minutes in soup or beef-tea they have a mildly aperient or deobstruent action, which is most efficacious in many cases of indigestion.

Lenz's Law defines the direction of the current induced in a conductor by the relative motion of that conductor and a magnetic field, and states that the induced current is always in such a direction that its electro-magnetic reaction on the field in which the conductor is moved tends to oppose the motion which produces it.

Leo, the name of 13 Popes of Rome, of which the following are the chief:—**LEO I.**, called "the Great," born towards the end of the 4th century, probably at Rome. In 440, when mediating between Aëtius and Albinus in Gaul, he was elected Pope, and occupied the Papal throne till his death in 461. When Attila invaded Italy in 452 Leo persuaded him to turn back, and four years later induced Genseric the Vandal to moderate the outrages of his troops when they took Rome. **LEO III.**, Pope from 795 to 816. In 799 an attempt made to depose him by the nephews of his predecessor, Adrian I., compelled him to flee to Spoleto, and subsequently to invoke the aid of Charlemagne. The latter, having acted as a judge in the case, acquitted him, and while the Frank Emperor lived Leo was at peace. A year after the trial, in 800, Charlemagne was crowned by the Pope at Rome, and the Holy Roman Empire was founded. Leo, however, contested with his successor the temporal sovereignty of Rome. **LEO X.** (**GIOVANNI DE' MEDICI**), born at Florence in 1475. In 1513, when his family were restored to Florence, he was elected Pope. He defeated a French invasion at the outset of his pontificate by the employment of Swiss troops, but after the battle of Marignano (1515) was obliged to submit to the loss of Parma and Piacenza. He took sides with Charles V. against Francis I., and on the expulsion of the French from Milan in 1521 recovered the lost duchies. He had also gained possession of Urbino, and had further magnificent projects in view when he died suddenly, it was thought by

some, of poison. LEO XIII. He acquired great distinction in many departments of knowledge, notably in philosophy, and in his later years became distinguished as a Latin poet. He was appointed in 1837 Referendary of the Segnatura, and while apostolic delegate at Benevento in the succeeding years he put down brigandage with a high hand. At the close of 1873 he became a cardinal, and in the later years of Pius IX. exercised a predominant control in matters of Papal policy. In 1877 he was appointed "Cardinal Camerlengo of the Holy Roman Church," and in the following year was chosen as successor to Pius IX. in the Papal chair. He reversed the ultramontane policy of the latter, and greatly improved the relations of the Papacy with Germany and France, being chosen as arbitrator in a dispute between Spain and the former in 1885, and in 1892 giving his sanction to the Republican Government. He declined to recognise the Italian Government in Rome, refused the vote of an income, and frequently protested against the law of guarantees and all forms of liberal education. At the same time he put forward the claims of the Papacy to intervene in the Socialistic question, and supported Lavigerie in his crusade against African slavery. He died in 1903.

Leonardo da Vinci (1452-1519) was the natural son of the Florentine notary, Ser Piero Antonio da Vinci. He was placed by his father in the studio of Verrocchio, and painted the chief figures in that master's picture of the *Baptism*, now in the Florence Academy. In 1478 Leonardo received his first commission. During this period he was encouraged by Lorenzo de' Medici, and besides numerous records of his other work at this time, there exist studies in the Uffizi and Vatican galleries for an *Adoration of the Magi*, and a *St. Jerome*. About 1482 he took service as an engineer with the Sultan of "Babylon," that is, Cairo, and visited Armenia, Cyprus, Constantinople, and Egypt. Leonardo's two great works during his first residence at Milan, whither he returned, were the erection of a bronze statue to Francesco Sforza, and the painting of his *Last Supper*. The *Last Supper*, which ranks as one of the finest pictures of the world, was painted in oil on the refectory wall of the convent of Santa Maria delle Grazie, at Milan, at the joint expense of the Duke and the Prior. Besides being engaged upon these and minor works, Leonardo was at the head of an academy of arts and sciences, and was studying natural philosophy, geometry, and optics. Early in 1500, or before, he went to Venice, but in the following year became attached to Cæsar Borgia, for whom he travelled as engineer over the greater part of Italy. In 1503 he again settled at Florence, where he was commissioned to paint an altar-piece at Santa Maria dell' Annunziata. The painting was carried out by Filippino Lippi and Perugino. He also began, for the Hall of Council at Florence, *The Battle of Anghian*, but after several years' work abandoned it. Between 1500 and 1505 two great portraits were painted, one, that of Ginevra Beuci, now lost, and the *Monna Lisa*, now in the Louvre. In 1506 Leonardo returned to Milan,

where he lived for the next nine years. The two *Virgins of the Rocks*, one of which is in the National Gallery, belong, however, to this period, as also does the *Holy Family* in the Louvre. In the autumn of 1514 Leonardo went to Rome, where the brother of his earliest patron was now Pope. He returned to Milan after a few months, and, after it had fallen to the French, was induced by Francis to return with him across the Alps. Accompanied by Francesco Melzi, he arrived at the Château Cloux, near Amboise, which had been assigned him, and here, after living three years, he died in 1519. Although no more than ten of his undoubted pictures remain, Leonardo da Vinci ranks with his rival Michelangelo and the younger Raffaele, whom he inspired. His drawing, which he did with his left hand (he wrote from right to left), is second only to that of Dürer. In the region of science Leonardo was only less great than in that of art. He discovered the construction of the eye, invented the camera-obscura and the saw which is still used in the quarries of Carrara, revived the science of hydraulics, and was the founder of the structural classification of plants.

Leonidas I., King of Sparta, son of Anaxandrides and 17th of the Agid kings, succeeded his half-brother, Cleomenes I., about 491 B.C. He was given the command of the force which was to make a stand at the pass of Thermopylæ against the army of Xerxes in 480 B.C. Herodotus says that this force consisted of 5,000 men, of whom 300 were picked Spartans. It was through the influence of Leonidas that this line of defence was not abandoned, and even when it was known that information had been given to the Persians which enabled them to turn it he refused to desert his post. He fell early in the fight, but his body was rescued after a sharp struggle.

Leopard (*Felis pardus*), one of the larger cats, ranging over the whole of the south of Asia, Ceylon, Java, Sumatra, and Borneo, and the African continent. The name has superseded that of Pard or Panther, now practically obsolete. Leopards vary greatly, and some authorities have thought that there are more species than one. They are exceedingly active and graceful in their movements, and can climb trees readily. Their favourite haunts are bushy and wooded ground; and their prey consists of deer, antelopes, sheep, goats, pigs, and it is said that they have a special fondness for the flesh of dogs. As a general rule they rarely attack man, but children and old women are often carried off by them; and, like tigers, some develop "man-eating" propensities. The average length is from 6 feet to 7 feet, of which the tail is rather less than half. The fur is pale fawn or reddish-buff, with dark rosettes; the under surface is white with dark spots, and the tail is marked with incomplete rings.

Leopardi, GIACOMO (1798-1837), was born near Ancona. His father was a scholar, and the son, making use of his large library, became a fine classical scholar before he was out of his teens. At eighteen he wrote a long poem, which

was succeeded in 1819 by his *Ode to Italy* and the *Ode on the Monument of Dante*. In 1822 he went to Rome, his father's wish being that he should take Orders, but he soon developed sceptical views, and returned after a year. For three years he continued at Recanati, and produced several lyrics, but in 1825 he went to Bologna in order to edit Cicero and Petrarch for a Milan publisher. Here he published in 1827 his *Operette Morali*. After living for a time at Florence, Milan, and Pisa, he was driven by stress of circumstances back to Recanati. In 1831 he escaped to Florence, where some more poems, including *The Resurrection* and *The Song of the Wandering Shepherd in Asia*, were published. He left Florence for Rome in consequence of disappointment in love, but returned after some months. Having made the acquaintance of a Neapolitan named Ranieri, he accompanied him to Naples, where he composed *La Ginestra*, and *The Sequel to the Battle of the Frogs and Mice*, a satire on the attempted Neapolitan revolution of 1820. An account of his last years at Naples is given in Ranieri's *Sette Anni di Sodalizio*. He died somewhat suddenly in 1837.

Leopold I., King of the Belgians, Prince of Saxe-Coburg-Gotha, was elected king by a National Congress in 1831, the separation of Belgium from Holland having been proclaimed in the previous year. He was born in 1790, and had married in 1816 the Princess Charlotte of England, who died without children in 1817. In 1830 he had declined the crown of Greece. It was only by the help of England and France that he was able to hold his throne and territory against the Dutch, but in 1833 peace was made. Leopold I. sanctioned the first Continental railway, passed safely through the revolutionary period in the middle of the century, and made treaties of commerce with England in 1851 and with France ten years later. He reigned until 1865, and was succeeded by his son, **LEOPOLD II.** (1835-1909), who chiefly signalised himself by his colonial enterprise in Western Africa. [BELGIUM, CONGO.]

Lepanto, now called EPAKTO, a town of Greece on the northern shore of the entrance to the Gulf of Corinth. It was anciently called Naupaktos, and was an important Athenian naval station. It passed from the Byzantine Empire to the Venetians, from whom it was taken, after a previous siege had failed, by the Sultan Bajazet II. in 1499. Near it took place the great naval victory of Don John of Austria over the Turks in 1571, in which Cervantes was wounded. The town was united with the Greek kingdom in 1829, and is now the seat of a bishop.

Lepcha, a people of Tibetan stock and speech, who form the substratum of the population in Sikkim and parts of Bhutan, along the southern slopes of the Himalayas. The Lepchas have acquired some degree of culture under Buddhist influences, and have reduced their Tibetan dialect to written form, using for the purpose a peculiar script known as the Kong alphabet. Type distinctly Mongolic, low squat figures (average height 5 feet), flat beardless features, yellowish skin, small hands

and feet, full, broad chest, high muscular development. The Lepchas reject caste, and are specially noted for their omnivorous diet, which includes snails, caterpillars, the tender sprouts of ferns and other wild plants. They still purchase their wives, who do most of the hard work, tend the yaks, swine, and poultry, while the men rock the cradle and keep the Buddhist "prayer-wheel" going. They are a light-hearted, cheerful people, and very friendly to the English, who regard them as excellent fellow-travellers.

Lepidodendron, a genus of fossil club-mosses occurring in Upper Palæozoic rocks from the Old Red Sandstone to the Permian. They attained a large size, being sometimes 100 feet in height. As in some species the bark splits longitudinally there seems to have been some means for secondary thickening in the stem, which possessed a central cylinder of scalariform tracheids and a thick cortex. The branching is dichotomous. The whole surface of the stems is covered with diamond-shaped scars of fallen leaves, each showing one vascular bundle as in living club-mosses (q.v.). The great variation in the shape and size of the scars on branches of different age has led to the description of single species under various names. The spore-bearing cones, known as *Lepidostrobus*, terminate the branches, are 1 to 18 inches long, and consist of overlapping sporophylls with large sporangia on their upper surfaces. They are heterosporous, the microspores being generally grouped in fours, and the macrospores being spherical. They are borne on different parts of the same cone, or perhaps sometimes on distinct cones.

Lepidoptera, an order of insects characterised by the fact that the wings are covered with scales, and including the moths and butterflies. The mouth parts form a tube, coiled when not in use, through which the food (honey) is sucked. There are four similar wings. The members of this group pass through a complete metamorphosis, their larvæ being the common caterpillars, some of which cause great destruction to fruit-trees, etc. The silkworm moths are the only ones of any commercial importance.

Lepidosiren. [MUD-FISH.]

Lepidosteus. [BONY PIKE.]

Lepidus, MARCUS ÆMILIUS, was the colleague of Julius Cæsar in the consulate in 46 B.C., and in his absence supported his interests at Rome. With Antony and Octavian he ruled the Roman world for a brief space (43 to 37 B.C.), having Africa as his province; but he was a "slight unmeritable man," and it was his wealth only which gave him influence. He took the part of Antony against his rival, but Augustus left him his wealth and dignities, and he died in peace in 13 B.C.

Leprosy is a disease which prevailed largely in Europe during the Middle Ages, but which is now practically confined in that continent to certain parts of Norway and Sweden. It is still, however, a formidable malady in India, China, parts of Africa.

Hawaii, and elsewhere. The disease occurs in two form—*tubercular* and *anæsthetic* leprosy. In the former variety little nodules are developed in the skin; these subsequently set up ulceration and much scarring results. In anæsthetic leprosy the nerve-trunks are primarily affected, and numbness, tingling, and wasting of muscles are prominent symptoms. The disease is said to be due to the development within the body of a micro-organism known as the *bacillus lepra*, which presents many points of resemblance to the tubercle bacillus. Leprosy is practically incurable.

Lepsius, KARL RICHARD (1810–84), the Egyptologist, was the son of a Naumburg magistrate of antiquarian tastes. He studied philology at Leipzig and Göttingen, and at Berlin under Bopp. In 1834 his *Palæography as an Instrument in the Study of Language* gained the Volney prize at the Institute of France. He soon after began to devote himself to his life-study, and as early as 1837 his letter to Rossellini on the hieroglyphic alphabet gave him high rank as an Egyptian scholar. In 1842 he was appointed Professor of Egyptology at Berlin, and by the advice of Bunsen was placed at the head of a scientific expedition to Egypt by the King of Prussia. The results of this were given to the world in his *Monuments of Egypt and Ethiopia* (1849–59), with 900 large plates, and a work on Egyptian chronology. His last work was a Nubian grammar.

Leptostraca, a subdivision of Crustacea, including *Nebalia*, a genus in some respects transitional between the Phyllopoda and the Malacostraca. The most ancient forms of Crustacea known—*e.g.* *Hymenocaris*—which occur in the Cambrian rocks, probably belong here.

Le Sage, ALAIN RENÉ (1668–1747), the author of *Gil Blas*, was born at Sarzeau, near the Breton coast, a few miles S. of Vannes. He was educated by the Jesuits, called to the Parisian bar in 1692, and he married two years later a poor but beautiful girl, Marie Huyard. The turning-point in his life was when the Abbé de Lyon placed his large Spanish library at the young man's disposal and added a pension to support his literary efforts. In the early years of the 18th century Le Sage translated plays of Rojas, Lope de Vega, and Avellaneda's continuation of *Don Quixote*. In 1705 his adaptation of Calderon's *Don César Ursin* was acted at the Court with success; but it was his *Crispin Rival de son Maître*, a farce produced in 1707, which laid the foundation of his reputation. In the latter year also Le Sage's second greatest and his most popular work, *Le Diable Boiteux*, was published. In 1735 he revised it, and left it in its present form. His best play, *Turcaret*, which was a retouching and enlargement of a rejected trifle called *Les Étrennes*, appeared in 1709. It was a satire on contemporary financiers, who met it with an organised opposition. Soon after this Le Sage transferred his services from the Théâtre Français to the Théâtre de la Foire, for which he wrote numerous light comic pieces and operettas. Meanwhile he was also at work upon his master piece, the first two parts of which were

published in 1715; a third part appeared in 1724, and the concluding one in 1735. Le Sage spent the last seven years of his life at Boulogne.

Lesbos, an island in the Ægean now known as Mytilene. It lies to the N. of the Gulf of Smyrna, and is included in Asiatic Turkey. Its area is estimated at 676 square miles. In the ancient world it had a high name for its wines, oil, and grain; and it was the home of Alcæus and Sappho the poets, of Pittacus the sage and statesman, and Theophrastus the philosopher. The island is mountainous, and suffers from frequent earthquakes, but enjoys notwithstanding a beautiful climate. Lesbos passed from the Byzantine Empire to the Venetians, and from them to the Turks, but its inhabitants are still Greeks.

Lesghians. [LEZGHI.]

Leslie, or LESLEY, a Scottish family, of whom the following were the most notable members:—ALEXANDER, first Earl of Leven (d. 1661), a soldier of fortune, who served with distinction under Gustavus Adolphus during the Thirty Years' War and, after the latter's death, commanded the Swedish army. He left the Swedish service in 1638, and took command of the Covenanters in Scotland. Charles I. offered £500 for his head, and insisted on his resignation as a condition of peace. In 1640 he again held command of the Scottish army, at the head of which he marched into England. After the conclusion of peace he was created Earl of Leven, and took an oath that he would never more bear arms against Charles. In 1644 he invaded England as "lord general" of the Covenanting army. In 1645, after Naseby, he received Charles I. at Newark, but he was soon after relieved of his command at his own request on account of his old age. He was soon, however, reinstated, and was in nominal command of the army which Cromwell defeated at Dunbar in 1650. Next year he was made prisoner and sent to the Tower of London, but was soon released. DAVID (d. 1682) played an important part at Marston Moor. He defeated Montrose at Philiphaugh, and was the real commander at Dunbar. He was created Lord Newark at the Restoration. JOHN LESLIE, or LESLEY (1527–96), Bishop of Ross, defended Catholicism against Knox at Edinburgh in 1561, and was sent to France by the nobles to bring Mary Stuart back to Scotland. When she arrived he became her chief adviser. After the discovery of the Norfolk conspiracy he was imprisoned in the Tower, and it was on the evidence of his confessions that Norfolk was executed. After his release he went to France and to Rome in Mary's interests, and was at the bottom of all the schemes for her liberation. He spent the rest of his life abroad, and died in a monastery near Brussels.

Leslie, CHARLES ROBERT (1794–1859), a *genre* painter, was the son of a clever clockmaker. He was born in London, but when quite young went back with his father to America. Having attracted attention by a portrait of G. F. Cooke the actor, he was sent by a subscription of merchants to study painting in Europe. While studying at the Academy schools and elsewhere the young man became

intimate with Washington Irving and Constable, and saw something of Coleridge. He painted the portrait of the first, and also illustrated his *Sketchbook and Knickerbocker's History of New York*. Leslie's first great success was his *Sir Roger de Coverley going to Church*. In 1821, when he exhibited *May Day Revels in the Time of Elizabeth*, he was elected A.R.A. In 1824 he visited Scott at Abbotsford, and painted his portrait. Two years later he became R.A., his diploma picture being *Queen Katharine and her Maid*. Among the best of his other pictures were *Uncle Toby and the Widow Wadman* (now in the National Gallery), *The Taming of the Shrew*, and *The Dinner at Mrs. Page's House*. His son, GEORGE DUNLOP LESLIE (b. 1835), a graceful painter of homely subjects, was elected R.A. in 1876.

Leslie, SIR JOHN (1766-1832), natural philosopher, was educated at St. Andrews and Edinburgh, his expenses being paid by the Chancellor, Lord Kinnoull. He abandoned the notion of taking Orders, and spent two years as a tutor in Virginia, and from 1790 onwards continued both to take pupils and to prosecute his own scientific researches. In 1793 he translated Buffon's *Natural History of Birds*, and in 1804 obtained the Rumford Medal of the Royal Society for his *Experimental Inquiry into the Nature and Propagation of Heat*. Next year he was appointed mathematical professor at Edinburgh, and held it for fourteen years, exchanging it in 1819 for the chair of natural philosophy. In 1832, the year of his death, he was created a Knight of the Guelphic Order.

Leslie, THOMAS CLIFFE, economist, was born about 1827. He held for some years the chair of economics and law at Belfast, and was one of the earliest adherents of the historical school of economists. His views are set forth in *The Land Systems* (1870), and *Essays in Political and Moral Philosophy* (1879). He died in 1882.

Lespinasse, CLAIRE FRANÇOISE, writer of some famous love-letters, was born about 1731 at Lyons. She died at Paris in 1776. While companion to Madame du Deffand she became attached to D'Alembert. The salon which she afterwards formed was brilliant in the extreme. She fell in love with the Marquis de Moira and M. de Guibert, her letters to whom were first published in 1809. More unpublished letters addressed to Condorcet appeared in 1887.

Lesseps, FERDINAND, VICOMTE DE, was born in 1805. He entered the diplomatic service in 1825, became consul at Cairo in 1833, and at Barcelona in 1842, and in 1848 as French ambassador at Madrid negotiated a postal treaty with Spain. In 1854, after a visit to Saïd Pasha, the then ruler of Egypt, he was invited to explain his scheme for a canal between the Mediterranean and Red Seas, which he did in his *Percement de l'Isthme de Suez Exposé*. The project having been sanctioned in 1856, a company was formed, and the work was begun in 1859, and on November 17, 1869, the Suez Canal was formally opened, representatives of most of the Powers being present. M. Lesseps was rewarded with the Grand Cross of the Legion

of Honour and with several foreign decorations. In 1873 he was made a member of the Académie des Sciences, and three years later was awarded a prize of 5,000 francs for his *Lettres, Journal, et Documents pour Servir à l'Histoire du Suez Canal*, published in 1875. The second great engineering scheme of Lesseps, the attempt to cut through the peninsula of Panama, involved great expense, and ended in ignominious failure. In 1889 the Panama Company went into liquidation, and in 1893 Lesseps, his son, and some others were convicted of corrupting Government officials and sentenced to terms of imprisonment, not carried out in the case of the first. He died in 1894.

Lessing, GOTTHOLD EPHRAIM (1729-81), the great German critic and dramatist, was one of the sons of the pastor of Kamenz, Saxony. After five years at the school of St. Afra, at Meissen, he was sent to Leipzig to study theology, but he preferred to continue reading the classical writers, while at the same time he indulged his passion for the drama. At the end of the year 1748 he went to Berlin in order to enter upon a literary career. During his three years' stay he wrote some plays, did some translations, and contributed critical articles to the *Vossische Zeitung*. At the end of 1751 he went to Wittenberg, where he read voraciously and took his degree in arts. After a year spent there he returned to Berlin, and during the next three years laid the foundation of his reputation as a critic by his articles in the *Vossische Zeitung*. With his friend Moses Mendelssohn he also wrote an essay on Pope as a metaphysician. In 1755 his first important play, *Miss Sara Sampson*, was also produced. Its success, when represented at Frankfort-on-the-Oder, induced the author to return to Leipzig. In 1756 he started for a foreign tour with a young merchant named Winkler, but was recalled by the outbreak of the Seven Years' War. After this, except for a nine months' visit to Italy with the Duke of Brunswick in 1775, Lessing was never out of Germany. In 1758 he again went to live at Berlin, and immediately began his important contributions to Nicolai's *Litteraturbriefe*. He also published a collection of fables, with a valuable essay on the nature of this department of literature. From 1760 to 1765 he was at Breslau, acting as secretary to General Taubentzien, the governor. Here he began *Laocöon* and *Minna von Barnhelm* and investigated the early history of Christianity. The two masterpieces just mentioned were published at Berlin in 1766 and 1767 respectively. Lessing, having been refused by Frederick the Great the post of keeper of the Royal Library because Voltaire fancied he had committed some offence against him, left Berlin for Hamburg in 1767. Here he received an appointment in connection with the National theatre, which an attempt was made to establish. The chief works of the Hamburg period (1767-70) were the *Hamburgische Dramaturgie*, a criticism of the plays produced, containing a complete theory of dramatic art, a defence of *Laocöon* against Klotze, and a comparison of ancient and modern views of death (*Wie die Alten den Tod Gebildet*). From

1770 to the end of his life Lessing's residence was at Wolfenbüttel. As librarian to the Duke of Brunswick he had command of a fine library, of which he made ample use. In 1771 he published a work on epigrams, described by Herder as itself an epigram, and in the following year *Emilia Galotti*, a modern play on the lines of the legend of Virginia. Lessing's last years were devoted to the discussion of philosophical and theological matters. In several pamphlets he contended for universal tolerance in religious opinion, and maintained that Christianity rested not upon speculations and researches, but upon its power of adaptation to human wants. Orthodox opinion compelled the Duke of Brunswick to order Lessing to refrain from further controversy; but he made bold to continue it in another form in his last play, *Nathan der Weise* (1779). Lessing was the father of modern German literature. In style he surpassed every German save Goethe and Heine, and in his *Laocöon*, acknowledged to be one of the world's greatest treatises on art, the method is clear and natural.

Lestock, RICHARD, English seaman, was born about 1678, and was posted in 1706. In 1743 he was promoted to be rear-admiral and vice-admiral, while second in command in the Mediterranean. There (1744) he shared in Mathews's unsatisfactory action off Toulon. Mathews suspended him and brought him to a court martial, but Lestock was acquitted, and was in 1746 promoted to be admiral. He died in December.

Letter of Marque, an extraordinary commission by the Lords of the Admiralty or the vice-admiral of a distant province to a commander of a merchant-ship or privateer to cruise against and make prize of an enemy's vessels by way of reparation for damage inflicted by that enemy. Ere such a letter could be granted it was necessary to make oath concerning the damage sustained, to offer proof that legal prosecution had been ineffectual, and to petition the head of the State for justice. Another name for the same commission is **LETTER OF REPRISAL**. The Treaty of Paris (1856) formally abolished all such commissions, but the United States, Spain, and Mexico never adhered to the understanding, which, no doubt, would be disregarded in war time by any Power which might find the treaty opposed to its apparent interests.

Lettres de Cachet, or **LETTRES CLOSES**, letters making known the royal will to individuals or corporations which were used by the kings of France prior to the Revolution. They were so called because they were folded up, and had the king's little seal (*cachet*) impressed upon them. They were often used so as to interfere with the proper administration of justice, and by their means many innocent persons who happened to be obnoxious to the king or his favourites were consigned to the Bastille.

Letts. [**LITHUANIANS**.]

Lettuce (*Lactuca*), a genus of Compositæ, represented by several British species and one of

unknown origin commonly cultivated as *L. sativa*. It probably came from Asia, and has been grown in England since 1562, Gerard describing eight varieties as early as 1597. It is an annual, with roundish or obovate-obtuse leaves, entire or slightly-toothed, and varying in colour. The flower-stem is erect, branching, and about 3 feet high; the involucre consists of a few overlapping bracts; the receptacle is naked; the florets are all ligulate and pale yellow, and the fruits are flattened and have a stipitate pappus. The cultivated forms are grouped as either *cabbage lettuces*, with compact heads and rounded leaves, or *cos lettuces*, with longer, upright, firmer leaves. They are not nutritious, but pleasantly cooling as salad. When flowering the plant produces more of the milky, bitter, and slightly narcotic sap from which the mild opiate *Lactucarium* is prepared. Venus mourning Adonis is said to have soothed herself on a bed of lettuces; Herodotus mentions them as served at the Persian Court 400 years B.C.; Virgil and Columella recommend them as salad; Augustus is said by Pliny to have been cured of an illness by eating them freely; and Galen is said to have used them as an opiate in the 3rd century A.D.

Leucine is a nitrogenous product occurring in many parts of the human body—*e.g.* the pancreas, spleen, liver, etc. It is usually formed as one of the products of the decay and putrefaction of nitrogenous matter. It forms, when pure, thin, glittering, tasteless, and odourless crystals, which dissolve in hot water, but are far less soluble in cold water or alcohol. It may also be formed by various chemical syntheses, and these, together with its chemical deportment, show the compound to be an α -amido caproic acid, possessing the formula $C_6H_9 \cdot CH(NH_2) \cdot CO_2H$.

Leuciscus, a genus of fishes of the Carp family (*Cyprinidæ*), from the north temperate zone of both hemispheres. Here belong the Chub, the Dace, the Ide, which when domesticated assumes a colouring like that of the Gold-fish, and is then known as the Orf, the Minnow, the Roach, the Rudd, etc.

Leucite, or **WHITE GARNET**, named from the Greek *leukos*, "white," is a silicate of alumina and potash, of considerable interest among volcanic minerals. It occurs in very regular white or grey crystals, sometimes an inch in diameter, having 24 trapezoid faces, the form being known as *leucitoid*. Optical characters show it to belong to the Pyramidal system; but when heated its angles undergo a slight change, and it becomes Cubic. Showers of crystals of leucite as big as peas are sometimes thrown out by Vesuvius; and they occur also in lavas known as *leucitophyres*, one of which near Rome has for centuries been used for millstones.

Leucocythæmia, a disease in which the leucocytes, or white corpuscles of the blood, are largely increased in number; there is often associated enlargement of the spleen and of the lymphatic glands. The disease usually proves fatal, and little is known concerning its causation and treatment.

Leucoma is a term sometimes applied to the white scars left on the cornea of the eye as the result of severe ulceration.

Leucoplastids, the name given to the starch-forming corpuscles found in the protoplasm of vegetable cells.

Leucorrhœa, or "whites," a term applied to the condition in which there is a whitish discharge (that is, a muco-purulent, as opposed to a blood-stained, discharge) from the female organs of generation. Treatment consists in the administration of tonics and the use of an antiseptic or astringent douche.

Levant (Ital. *levante* = "rising"), the name given to the E. part of the Mediterranean and to the shores of Asia Minor, over which to the eye of a European the sun rises. The name "Levanter" is similarly given to a Mediterranean eastern wind.

Levelling, a process in land-surveying for the determination of the variation in level over a given area. The instrument employed is the surveyor's *level*, consisting of a telescope mounted on a tripod stand and arranged so that it can be adjusted accurately horizontal by means of a spirit-level of the ordinary type. If two poles, graduated in feet and inches, are held vertical at two points, one some distance in front of the telescope and the other behind, the readings on them when viewed through the telescope will only be identical when the two points are at the same level. The difference of level will be the difference in their readings. On this principle a series of observations may be taken, which however, require correction for the curvature of the earth when taken over a large area.

Lever, CHARLES JAMES (1806-72), was the second son of James Lever, of Dublin. Both his parents were of English descent. He graduated at Trinity College in 1827, and in the succeeding years travelled in Holland, Germany, and Canada. He then became a surgeon; but, though he had a good practice and had inherited half his father's property, his extravagance compelled him to look for an additional source of income in literature. In 1837 *Harry Lorrequer* began to appear in the *Dublin University Magazine*. Three years later the author went to live at Brussels, but continued to write. In 1840 *Charles O'Malley* appeared in serial form. In 1842 Lever returned to Dublin on an invitation to become editor of the magazine whose fortune he had made. In it *Tom Burke of Ours* came out in 1844, and was followed by *The O'Donoghue* (1845) and *The Knight of Gwynne* (1847). He was visited by Thackeray when on his Irish tour, and the *Irish Sketchbook* was dedicated to Lever. In 1845 he resigned his editorship, and began a wandering life on the Continent. At Florence he wrote *The Dodd Family Abroad* (1854), the last of his novels which had real merit. Later, however, he contributed novels to *Blackwood* and *Cornhill*, and wrote "topical" notes for the former paper signed Cornelius O'Dowd. In 1857 he was appointed consul at Spezia, and ten years later was

transferred to Trieste, where he died. He paid a last visit to Ireland in 1871.

Leverrier, URBAN JEAN JOSEPH (1811-77), the greatest French astronomer of the 19th century, was a native of St. Lô, Normandy. After a brilliant career at the Ecole Polytechnique he obtained some reputation as a chemist, but was induced to transfer his attention to the study of astronomy in 1837 by the offer of the post of teacher at the Polytechnic. He soon attracted the attention of Arago, and in 1843 published *Tables de Mercure*. In 1846 he was elected to the Académie des Sciences, and in the same year, as the result of minute investigations, he indicated the spot where an unknown planet would be found. A few days later Neptune was discovered within a degree of the place. John Couch Adams, of Cambridge, had reached a similar result independently. The Royal Astronomical Society awarded a medal to both astronomers for the discovery, and Leverrier afterwards received the Copley Medal, the Legion of Honour, and many foreign decorations. He also became tutor to the Comte de Paris, and professor in the Faculté des Sciences. In 1849 he entered the Assembly as a Republican, but was opposed to the Socialists. Nevertheless, Napoleon III. made him a senator, and appointed him Inspector-General of Public Instruction. In 1854 he succeeded Arago as director of the Paris Observatory, from which he was obliged to retire in 1870 on account of the outcry which his reforms excited. He was reinstated by Thiers with limited powers in 1873, and devoted the rest of his life to the revision of planetary theories, a comparison of results with observations, and the construction of illustrative tables.

Levers are mechanical devices used for transmitting and altering the direction and magnitude of forces. If a bar can turn on a pivot or fulcrum near one end, and a downward force is applied to the long end, the short end will be raised with a greater force and through a correspondingly smaller distance, as when a crow-bar is used for lifting a heavy body. Call the force applied to one point on the lever P, and the force available at some other point W; then if the fulcrum is between the P and W ends of the lever, W will act in a contrary direction to P, and the magnitude of W will be to the magnitude of P as P's distance from the fulcrum is to W's distance. If W is between the fulcrum and P, or *vice versâ*, the two forces will act in the same direction, and their magnitudes will still be precisely proportional to their distances from the fulcrum. A bell-crank lever is bent at right angles, the fulcrum being at the angle, and a force applied at one end is transmitted at right angles to its original direction. In any lever or system of levers, the force applied at one point, multiplied by the distance through which it acts must—neglecting the effects of friction at the pivot and of bending in the lever—be equal to the force developed at any other point multiplied by the distance through which it acts.

Levo, a prefix applied to those optically active compounds which turn the plane of polarisation to the left. [POLARISATION.]

Levulose, also called FRUIT SUGAR and FRUCTOSE, is a member of the sugar group of compounds, and possesses the formula $C_6H_{12}O_6$. It is present in almost all sweet fruits, usually associated with an equal quantity of grape-sugar or dextrose (q.v.). It is formed together with this compound by boiling a solution of cane-sugar for some hours with a dilute acid, the process being known as the inversion of sugar. If inulin (q.v.) be similarly treated, levulose alone results. If extracted thoroughly by alcohol, it may be obtained crystalline, forming needle-like silky crystals. It is soluble in water and alcohol, and in all its chemical reactions it closely resembles dextrose. It differs, however, from this substance in turning the plane of polarised light to the left; in being less easily fermented, being more soluble and yielding different products upon oxidation. This last difference is due to the two compounds possessing different constitutions, grape-sugar belonging to the class of bodies known as *aldehydes* (q.v.), while levulose possesses a constitution which places it among the *ketones* (q.v.). [SUGAR, CARBO-HYDRATES, DEXTROSE.]

Lewald, FANNY (1811–89), German novelist, was born of Jewish parents at Königsberg. In 1840 she went to live at Berlin, where fifteen years later she married Adolf Stahr. Besides many novels, *Von Geschlecht zu Geschlecht*, etc., she wrote books on England and Italy, and an essay on Woman's Rights (*Für und Wider die Frauen*). *Meine Lebensgeschichte* (1861) is an account of part of her own life.

Lewes, the assize town of Sussex, is 10 miles N.E. of Brighton. It is probably of very ancient origin. In late Saxon times there was a mint here, and the town is celebrated in later times as giving its name to the victory of Simon de Montfort in 1264. There are only slight remains of the castle and priory. Some of the seven churches are, however, of interest. The grammar school was founded in 1512, but most of the buildings are of very recent date. Race-meetings are held three times a year. The town was incorporated in 1881, and disfranchised by the third Reform Bill. Its chief industries are the corn and malt trade and tanning. Pop. (1901), 11,249.

Lewes, GEORGE HENRY (1817–78), a versatile writer on philosophy, science, and the drama, was born in London, and educated there and in France. He was first in a notary's office; then in the employment of a Russian merchant next studied medicine, but was disgusted by his hospital experiences, and in 1838 went to Germany. After his return he several times appeared on the stage; but, though he had talent, he was without the necessary physical qualities. After his marriage he entered upon a literary career, writing at first chiefly upon dramatic subjects, in the quarterly reviews. In 1850 his play *The Noble Heart* was produced, he himself taking a part. In 1845–46 appeared his *Biographical History of Philosophy* in 4 vols., and in 1853 *Comte's Philosophy of the Sciences*. In 1851 he first made the acquaintance of Mary Ann Evans (George Eliot) (q.v.), with whom three

years later he went to Germany. His *Life of Goethe* appeared soon after their return. He now began to give much attention to scientific studies, and published in 1859 *The Physiology of Common Life*, in 1862 *Studies in Animal Life*, and in 1864 a book respecting Aristotle's scientific anticipations. In 1865 he became first editor of the *Fortnightly Review*, but soon resigned the position to Mr. John Morley. His last important work, *Problems of Life and Mind*, was begun in 1873, but the last volume did not appear until after his death.

Lewis, SIR GEORGE CORNEWALL (1806–63), a statesman and political writer, was born in London and educated at Eton and Oxford, and was created D.C.L. in 1857. He was called to the bar in 1831, but practised very little. In 1847 he entered Parliament as a Whig, and was soon after appointed one of the Secretaries to the Board of Control. Next year he became Under-Secretary for the Home Department, and was from 1850 to 1852 Financial Secretary to the Treasury. On the resignation of Mr. Gladstone he became Chancellor of the Exchequer, and as such carried the Newspaper Stamps Bill through the House of Commons. In Lord Palmerston's second Ministry he was Home Secretary at first, and afterwards Secretary for War. He died while holding the latter office. His writings are of high merit, and exhibit great versatility. His *Credibility of Early Roman History* is incidentally a valuable treatise on historical evidence. He also wrote *inter alia* several works on political science.

Lewis, MATTHEW GREGORY (1775–1818), "Monk Lewis," was born in London and educated at Westminster and Christ Church, and in 1792 met Goethe at Weimar. Two years later he became an *attaché* at the Hague, where *Ambrosio, or the Monk*, was written. It was highly popular, but had to be expurgated under threat of a public prosecution. Lewis sat in Parliament from 1796 to 1802, saw the best society, and wrote plays and poems, his *Castle Spectre*, produced at Drury Lane in 1798, being the most successful. In that year he first met Sir Walter Scott. He died of yellow fever in 1818.

Lexington. (1) A village, eleven miles N.W. of Boston, where, on April 10, 1775, the skirmish took place which began the American Revolution. There is a monument to commemorate those who fell. (2) A town in Kentucky, a few miles S.E. of Frankfort, is the capital of Fayette county. It is the junction for four railways, and contains the State University, Agricultural College, and lunatic asylums. It was founded in the first year of the Revolution: hence its name. (3) A village in Virginia, the capital of Rockbridge county, where is the Washington and Lee University, founded in 1749, and the Virginia Military Institute. "Stone-wall" Jackson and Robert Lee were buried here. (4) The capital of Lafayette county, Missouri.

Leyden, one of the chief towns of Holland, stands on the Rhine a few miles from its mouth, about midway between Haarlem and Rotterdam,

and 15 miles N.W. of the Hague. In the Middle Ages it was celebrated for its cloth manufacture, but saw troublous times, being six times during the 15th century besieged by the "Hooks." During the War of Independence it held out from October, 1573, to the same month in 1574; and the inhabitants were rewarded for their heroism by the establishment of a university which was to take a high place in the learned world. Medicine and law have perhaps been its most prominent faculties, but theology and classical learning also had their place. Amongst alumni and professors have been Grotius, Descartes, Scaliger, Salmasius, Sir Thomas Browne, Alexander Monro, and recently Kuenen and Cobet; while Linnæus and Boerhaave have been among the directors of the celebrated botanic gardens. The university possesses a fine collection of Greek and Oriental MSS., a fine natural history museum, a museum of antiquities especially rich in its Egyptian department, and an ethnographical museum containing Von Siebold's Japanese collection. It has now somewhat diminished in importance, but has still fifty professors and some 800 students. Rembrandt, Jan van Steen and Gerard Douw were natives of the places, as also were some of the Elzevirs. The "Burg," a round wall resting upon arches on a mound in the centre of the town, is said to be of Roman origin; the town hall dates from the 16th century. The church of St. Pancratius has a monument to Van der Werf, the hero of the siege, and that of St. Peter contains memorials of Scaliger, Arminius, and Boerhaave. The chief modern institution of Leyden is its school of navigation. An open space on the south of the town commemorates by its name, "The Ruin," an explosion by which in 1807 a large part of Leyden was destroyed. After the seventeenth century its population and trade began to decline, and they have never since materially increased.

Leyden Jar is a particular form of electrical condenser (q.v.). A glass jar is coated on its lower half inside and outside with tinfoil, the lip and upper half being varnished to improve the insulation. Sometimes the jar is partly filled with strong sulphuric acid, which replaces the foil as the inner conductor, and keeps the interior surface of the glass dry by absorbing moisture. A rod terminating in a brass knob is usually fixed to a wooden stopper and connected to the inner coating. The capacity of a Leyden jar is small, but the dielectric strength of the glass is considerable, so that, by charging the jar with an influence machine until a very great difference of potential exists between the two coatings, discharges of considerable vigour may be obtained.

Leyden, JOHN (1775–1811), a Scotch physician and poet, was born at Denholm, Roxburghshire, and distinguished himself as a scholar of Edinburgh University. He studied Oriental and modern languages, and made the acquaintance of Sydney Smith, Brougham and Jeffrey, at the University Literary Society. In 1799 he published *A Historical and Philosophical Sketch of European Discoveries in Northern and Western Africa at the End of the*

18th Century, edited for Constable the *Complaynt of Scotland*, and helped Scott with the earlier volumes of his *Border Minstrelsy*. He also edited for a time the *Scots' Magazine*, and wrote some lyrics of some merit. In 1803 he went out to Madras to take the appointment of assistant-surgeon and made a report on the diseases, the crops, and the languages of Mysore. In 1805 he went to Penang for his health, and soon after his return was made Professor of Hindustani at Calcutta. In 1809 he was appointed to judicial office by Lord Minto, and in 1811 went with him to Java as Malay interpreter, but died of fever soon after his arrival.

Leys, HENRI JEAN AUGUSTE, BARON (1815–69), a Belgian painter, was born and lived at Antwerp. He was ennobled by Leopold I. in 1862. Of his pictures, which are after the old Flemish style, the best were *Rembrandt's Studio*, *A Flemish Wedding*, *Luther Singing in the Streets of Eisenach*, and *Erasmus in his Study*. Antwerp townhouse is decorated by a series of scenes from its history from his hand.

Lezghi (LEZGHIAN, LESGHIAN), collective name of the east Daghestan tribes, Caucasus; Lekhi, the Georgian form, is applied by their southern neighbours to all the Daghestan peoples—Avars. Kazikumuks, Akashas, Kurines, Udes, etc., who differ greatly in speech, but closely resemble one another in their physical features. "A fine handsome race, well built, with black eyes and hair, but smaller in stature than the Georgians" (Monteith). There are altogether over fifty distinct Lezghian tribes, all of whom are Mohammedans except the Dido of the Andi district, whom their neighbours call Devil-worshippers. The Avars, who are the most numerous and renowned of all the Lezghians, comprising nearly one-fifth of the whole nation, are by most historians regarded as akin to the mediæval Avars, who founded an empire on the Danube overthrown by Charlemagne. But those Avars were certainly of Mongolic stock and speech, whereas all the Lezghians are of true Caucasian type, and speak extremely harsh languages, showing no kind of affinity with the Mongolo-Tartar linguistic family. Some of the dialects have an unpronounceable click, which occurs both in the beginning, the middle, and the end of words. Total Lezghian population, 707,000, of whom 155,000 belong to the Avar group.

Lhasa (LHA-SA, "God's Seat,") the capital of Thibet, stands in the middle of an elevated plain more than 11,000 feet above the sea-level, in lat. 29° 39' N. and long. 90° 57' E., according to Nain Singh. The river Ki-chu flows past the south of the city, which is surrounded by a wall with barren hills in the background. Outside are large suburbs, in which many of the houses are built of sheep and goats' horns set in clay. Lhasa is the centre of the Buddhist religion. The Grand Lama (Dalai Lama), the civil and ecclesiastical ruler, under the Chinese, of Thibet, lives in the Potala, a hill on the N.W. of the city crowded with temples and palaces. The temple of Labrang contains a life-size image

of the Buddha and other holy persons, to whose shrines pilgrims come from all parts of Asia. Two other temples are those of Ramo Cuhe and Moru. There are numerous monasteries in the country round Lhassa, those of the Foui Ling, Dai-pung, and the Galdan Lamaserai, whose abbot is a great dignitary, being the chief. Lhassa is the centre of the caravan trade of Asia. Large quantities of tea are imported from China; for it are exchanged Tibetan wool-stuffs, earthenware, and pastille-sticks, which are made by the inhabitants. Much of the trade is in the hands of the Kashmiris, who are Mohammedans. Beside some Chinese, the inhabitants include not a few immigrants from Nepal and Bhotan, who are skilful metal-workers. A British expedition in 1904 arranged a convention at Lhassa, which was ratified in 1906 by China, and which secured certain advantages to England.

Lhopa, a wild tribe of the eastern Himalayas, in Bhutan, towards the frontiers of Bengal. The Lhopa, *i.e.* "Southerners," in reference to Tibet, are also called *Lho-kha-Chra*, *i.e.* "Tattooed People of the South." They are of Tibetan stock, showing affinities to the neighbouring Avars and Mechi, with whom they are often grouped.

L'Hôpital, MICHEL DE (d. 1573), a great French statesman, was born in 1504 or 1505. He studied at Toulouse and Padua, and after the death of Charles de Bourbon, his patron, to whom his father was physician and comptroller, became auditor of the Rota at Rome. In 1534 he returned to France, entered at the Parisian bar, and obtained by his marriage the post of counsellor to the Parlement in 1537. From 1560 to 1568 L'Hôpital was Chancellor of France. He advised the registration by the Parlement of the edict of Romorantin, protecting heretics against the Inquisition, prevailed upon the Council to summon the States-General in 1560, and promoted the conference of Poissy. In 1563 he underwent a temporary disgrace; but in the same year Charles IX. was declared of age by his advice, to which also was due the refusal of the Parlement to sanction the acts of the Council of Trent as contrary to Gallican liberties. His last years were spent in literary retirement.

Li (LOI, LI-TSI), the aborigines of the large island of Hainan, off the south coast of China, now mainly confined to the central districts. There are two social groups: *Shuh-Li*, *i.e.* "Ripe" or "Baked," Li, meaning civilised or settled; and *Song-Li*, *i.e.* "Raw" Li, in the sense of wild, savage or unreduced.

Liability of Employers. [MASTER AND SERVANT.]

Liao-yang, a town in Manchuria which was the scene of a sanguinary battle in the Russo-Japanese War, 1904; the fighting lasted for ten days, and the casualties on each side numbered nearly 20,000. The Japanese were victorious, and captured the town.

Lias, said to be so named from a provincial pronunciation of "layers," from its well-marked stratification, is the lowermost division of the

English Jurassic system (q.v.). It extends continuously from Dorsetshire to the mouth of the Tees, outlying patches occurring at Carlisle, in Skye and the west of Scotland, and under the Chalk escarpment in the north of Ireland. It consists of three divisions: the *Lower*, dark shales, with thin blue and brown nodular bands of limestone; the *Middle* or *Marlstone*, argillaceous limestone, with micaceous sands and clays, and the "black band ironstone," 15 to 20 feet thick, of the Cleveland district in Yorkshire; and the *Upper*, blue clays and shales, with septarian nodules. It passes, by sandy passage-beds, conformably into the beds both above it and below. Its fossil plants comprise *Equisetites*, ferns, cycads, and conifers (*Cupressus*, *Pinites*, etc.), whilst numerous insect-remains, including wood-boring beetles, dragon-flies, and others, also point to the proximity of land. The shallow-water marine life is abundantly preserved, including corals; such crinoids as *Extracrinus*; starfish; sea-urchins; numerous brachiopods, especially *Rhynchonella* and *Spiriferina*, the last of its family; still more pelecypods, especially scallops (*Pecten*), *Lima* and *Gryphaea*; and many gastropods, such as *Cerithium*, *Turbo*, *Trochus*, and *Pleurotomaria*. The most characteristic molluscs, however, are the cephalopods, including species of *Nautilus*, 60 species of *Belemnites*, and upwards of 130 of the *Ammonitidae*. Many of these last have a small vertical range, but occur on the same relative horizons over most of western Europe, so that the whole formation is subdivided into zones (q.v.) named after the various species of this group. Fish are numerous, including the teeth (*Acrodus*, *Ceratodus*) and spines of placoids and whole ganoids, such as *Lepidotus*; but the large reptiles, such as *Ichthyosaurus* and *Plesiosaurus*, are so characteristic that the period has been termed the "age of reptiles." The Lias, or *Brown Jura*, of Germany much resembles that of England. Its upper member yields paraffin shale. In France and Switzerland the Lias is subdivided into four:—

Toarcien	= Upper Lias.
Liassien	= Middle Lias.
Sinemurien	= Lower Lias.
Hettangian	= Infra-Lias.

Libanius, the ablest Greek writer of the 4th century A.D., was born near Antioch about 315. His popularity as a teacher at Constantinople led to his expulsion in 346 on a charge of studying magic. He now passed five years in Nicomedia, and, after again spending some years in Constantinople, retired to his native place in 354, and died there in the last year of the century. Though a pagan, he was favoured by the Christian emperors, and was the teacher of St. Chrysostom and St. Basil.

Liban, a Baltic port of Russia, some 140 miles W.S.W. of Riga. It has a fine harbour for purposes of trade, and a first-class naval harbour has been recently constructed. From this port are shipped large cargoes of grain, petroleum, linseed, eggs, and oil-cake; and the imports, chiefly British, are coal, cotton, iron, and herrings. The chief industries of the town are iron-founding and brewing, and there is a school of navigation. The population is chiefly

German. The organ in Trinity church is one of the largest in the world.

Libel (from the Latin *libellus*, "a little book") is a malicious defamation expressed either in writing, or by signs, pictures, etc., tending either to blacken the memory of one who is dead or the reputation of one who is alive, and thereby exposing him to public hatred, contempt, or ridicule. In other words, it is *written slander*, and it is generally treated as a more serious mode of defamation than slander. [SLANDER.] Whatever written words tend to render anyone ridiculous or to lower him or her in the estimation of the world is a libel, although the very same expressions if spoken might not have been slander or defamation in the legal sense of those terms. To complete the offence publication is necessary, that is, the communication of the libel to some person, either the person libelled or some other. The mere writing of defamatory matter without publication is not an offence legally punishable; but if a libel in a man's handwriting be found, the proof is thrown upon him to show that he did not also publish it. Libellers may be punished by indictment or criminal information, and by action. In a civil action the question whether the publication is or is not a libel is one for the judge or court. Indictment or criminal information is for the public offence—as it is termed—for every libel has a tendency to a breach of the peace by provoking the person libelled; the civil action is to recover damages by the party for the injury caused him by the libel. A fair report of judicial proceedings does not amount to a libel, and by the Libel Law Amendment Act of 1888, "fair and accurate newspaper reports of proceedings of a court or public meeting" are protected. An Act of Parliament of Victoria's reign, the 6 & 7 Vict., c. 96, entitled "An Act to amend the Law respecting Defamatory Words and Libel," has made important alterations in the law of defamation and libel, for it enacts: (Sec. 1), That in any action for defamation it shall be lawful for the defendant, subject to certain notice in writing therein prescribed, to give in evidence, in mitigation of damages, that he made or offered an apology to the plaintiff for such defamation at such time as in the said section is more particularly described. (Sec. 6), That on the trial of any indictment or information for a defamatory libel, the defendant, having pleaded such plea as therein-after mentioned, the truth of the matters charged may be inquired into, but shall not amount to a defence unless it was for the public benefit that the said matters charged should be published. The defendant must in his plea to such indictment or information allege the truth of the matters charged in the manner that is required in pleading a justification to an action for defamation. Sec. 7 enacts that when on the trial of any indictment or information, for the publication of a libel, under the plea of not guilty, evidence shall have been given which shall establish a presumptive case of publication against the defendant by the act of any other person by his authority, it shall be competent to the defendant to prove that such publication

was made without his authority, consent, or knowledge, and that the said publication did not arise from want of due care or caution on his part. This Act does not extend to Scotland, but it was extended to Ireland by a later statute. The printer of a libel is liable to prosecution as well as the author, and so is the person who sells it, even though he be ignorant of its contents. It is a good defence to an action for libel that it was written or printed on a privileged occasion—for instance, the giving a character of a servant or commenting upon a matter of general interest to the public.

Libration. The moon rotates on her axis in the same time as she revolves in her orbit; but, although the former motion is perfectly uniform, the latter is not. Hence, instead of seeing always exactly the same portion of her surface, we have two narrow strips extending between her poles on her eastern and western sides alternately shown to us. This phenomenon is called the moon's *libration in longitude*. Since the moon's axis is not quite perpendicular to the plane of her orbit, at different times we see different bits of the surface round her poles. This is the *libration in latitude*. The fact that we are on the surface, and not at the centre, of the earth causes the *diurnal libration*; for we see a little more of one limb when the moon is on the horizon, and a little more of the other when she is high in the heavens. On account of these librations we are able to get some knowledge of rather more than half the moon's surface.

Libretto (Italian, "little book"), a book containing the words of an opera or oratorio. They very rarely possess any literary value.

Libri-Carucci, GUILLAUME TIMOLEON, CONTI DI (1803–69), an Italian mathematician, born at Florence, became professor of mathematics in Pisa University before he was of age. In 1830 he was compelled by his liberal opinions to take refuge in France, where he was naturalised, and in 1833 was appointed professor at the Sorbonne on Arago's recommendation. He also became Chief Inspector of Public Instruction, and was given the Legion of Honour, and edited for some time the *Journal des Savants*. He collected a fine library, but was not scrupulous in his method of obtaining books, and in 1850 was sentenced to ten years' imprisonment for stealing from public libraries. He died at Fiesole, having spent some time in England. His chief work was a *History of the Mathematical Sciences in Italy* (1834–41).

Libyans. [BERBERS.]

Lice, a family of wingless Rhynchota which live on the skin of mammals. The six legs each end in a strong hooked joint, by means of which they attach themselves to the fur. The proboscis is armed, and by this the insect cuts into its host and sucks its blood. The metamorphosis is incomplete, and the development is generally very rapid, the commonest of the three lice which attack man (*Pediculus capitis*) being mature in about three weeks. The Bird-lice (*Mallophaga*) are often associated with the true lice or *Pediculidæ* as an order, the Anoplura. The Bee-louse

(*Braula cæca*, Nitsch) is quite distinct; it is a small wingless fly belonging to the Homaloptera (q.v.). Woodlice are Crustacea, and Plant-lice are Aphides, both very different.

License (LICENSING LAWS) generally is an authority to do something which would otherwise be inoperative, wrongful, or illegal. In regard to real property a license is an authority to do an act which would otherwise be a trespass. Thus a lease often contains a covenant by the lessee not to assign without license. A marriage license is an authority enabling two persons to be married. [MARRIAGE.] Licenses for the manufacture and sale of intoxicating drinks and refreshments are of three kinds, according to the authorities by whom they are granted. A Magistrate's License is analogous to a certificate that the applicant is a proper person to be intrusted with the sale of intoxicating liquors and that the premises which he occupies are suitable for the purpose. In counties new licenses are granted by the justices present at the meeting for that purpose held by them every year, and called "The General Annual Licensing Meeting," and must be confirmed—except in the case of outdoor licenses—by a standing committee appointed every year from among themselves by the justices at Quarter Sessions and known as the "County Licensing Committee." In boroughs licenses are granted by the "Borough Licensing Committee," appointed every year from among themselves by the borough justices, and confirmed by the whole body of borough justices, or if the borough has not ten justices, licenses are granted by the borough justices and confirmed by a "joint committee" composed of six borough and county justices. The Magistrate's License entitles the holder to take out the corresponding Excise License which is granted by the Commissioners of Inland Revenue, and is a mode of levying a tax on the sale of liquors and refreshments. Both Magistrates' and Excise Licenses require to be renewed every year, and are of various descriptions according to the number and kind of liquors authorised to be sold under them (the public-house license, the beer license, etc.), and as to whether the liquor is to be consumed on or off the premises and to the period of day during which such consumption is authorised. A provisional license may also be granted in respect to premises about to be constructed or in course of construction. An additional license is one granted to the holder of a "strong beer dealer's wholesale license," and authorises him to sell beer by retail for consumption off the premises. There are also excise licenses granted without the necessity of a Magistrate's License—for instance, the "Refreshment House License," which does not authorise the sale of intoxicating liquors, and the licenses to brewers, wholesale beer-dealers, maltsters, distillers, dealers in foreign wines, manufacturers of and dealers in tobacco, etc. Among miscellaneous licenses may be mentioned the Occasional License, in the strict sense of the word, viz. a license granted by the excise authorities on the written consent of a justice to a person already licensed to sell liquors

to be consumed off the premises, authorising the sale of them at some other place between certain hours and on a special occasion, viz. a fair, race, ball, etc., specified in the license. The term "occasional license" is also applied to an exemption granted by the Commissioners of Police or other "local authority" of the district exempting the person to whom it is granted from the rules relating to the closing of premises on a special occasion, e.g. a fête or ball, during certain hours specified in the license. There are also numerous other varieties of license, as for private lunatic asylums, music-halls, race-courses, theatres, game, hackney coaches, etc.

Lichens, a large and varied group of plants, mostly dry, dead-looking, slow-growing, but long-lived, that used formerly to be classed as a separate division of the Thallophyta, co-ordinate with Algæ and Fungi. The view originally put forth by Schwendener is, however, now generally accepted, according to which lichens are regarded as Algæ living in symbiosis (q.v.) with Fungi. The alga is one of the lower, unicellular forms, such as *Proto-coccus* or *Nostoc*, forming a layer of green cells, or *gonidia*, enclosed by the hyphæ of an ascomycetous fungus, belonging either to the Discomycetes or to the Pyrenomycetes, or very rarely by those of a basidiomycetous one. The spores of the lichen-fungus are generally produced in *apothecia* or in *pyrenocarps* and, on germinating, produce hyphæ which enclose gonidial cells or *soredia*, the two growing into a new thallus. The apothecia and pyrenocarps seem to be fructifications resulting from a sexual act. A branch hypha (*procarp*) has its basal portion twisted like a corkscrew (the *archicarp* or *ascogonium*), whilst its upper portion is a row of cells (*trichogyne*) reaching to the surface of the thallus. In special cavities in the thallus (*spermogonia*) numerous male bodies or *spermatia* are produced on hyphal bases known as *sterigmata*. The spermatia are conveyed by water to the trichogyne, with which they conjugate, and, as a result, *asci* grow out from the ascogonium. Lichens grow on exposed situations on rocks, walls, or trees, in all parts of the globe, extending farther up mountains and towards the poles than other plants, and living far longer than most fungi or algæ. Some are nutritious, such as Iceland Moss (q.v.), tripe-de-roche (*Umbilicaria*) and Reindeer Moss (*Cladonia rangiferina*); and others afford important dyes, such as orchil and litmus (q.v.), from species of *Rocella*, and cudbear, from *Lecanora tartarea*.

Lichfield, one of the oldest towns in England, is in South Staffordshire, a few miles N.W. of Tamworth, and 17 miles S.E. of the county-town. Its ecclesiastical history dates back to 656, when a Mercian bishopric was founded here. In the last quarter of the 8th century it became an archiepiscopal see, and for a time contested the primacy with Canterbury. In the 11th century the see was transferred to Chester, and then to Coventry, but in 1148 it again became the seat of a bishop. There was a Norman cathedral here, but the present building is in the main Early English, dating from the opening of the 13th century. [GOTHIC

ARCHITECTURE.] It was much injured during the siege in 1643, but was repaired after the Restoration, and was restored during the third quarter of the 19th century. There are no traces of the castle where Richard II. was imprisoned; but there are hospitals, founded in 1495 and 1504, and a King Edward VI. grammar school, among whose pupils were Dr. Johnson, Garrick, and Addison. The former was a native of Lichfield, and in 1838 a statue was erected here. Lichfield was disfranchised by the third Reform Bill. It gives its name to a county division. Pop. (1901), 7,902.

Lichtenberg, GEORG CHRISTOPH (1742-99), a physicist and satirical writer, was born at Darmstadt, and held chairs of Physics at Göttingen from 1770 till his death. He described in two memoirs on electricity what are called the "Lichtenberg figures" (q.v.), and partly edited from 1780 to 1782 the *Göttingen Magazine of Literature and Science*. As a satirist he became known as the ridiculer of Lavater and of Voss's views on Greek pronunciation.

Lichtenberg Figures illustrate the distribution of static charges of electricity on the surfaces of insulators. If a charged body is applied to a sheet of ebonite or other non-conductor, the charge will leak over its surface in an irregular manner, and may be rendered evident by dusting the surface with a fine powder, which adheres to the electrified portions. The shapes of the figures vary according to whether the charge is positive or negative. If different patterns are traced out with two conductors—one positively and the other negatively charged—and if the plate is then dusted over with a mixture of red-lead and sulphur powder by means of a sieve, the two powders will arrange themselves on the two patterns. The red lead becomes positively, and the sulphur negatively, charged by friction with the sieve, and the different powders adhere respectively to the negatively and positively charged parts of the plate.

Lick Observatory, THE, was built at the expense of James Lick, who died in 1876 and is buried in a vault underneath the pier that supports the great telescope. It is situated on one of the peaks of Mount Hamilton, 26 miles E. of San José, California, and belongs to the university of that state. The telescope has an object-glass 36 inches in diameter, second only to the telescope at the Yerkes Observatory, Chicago.

Lictors, officers who attended the Roman magistrates in ancient times; they bore the fasces, and their duties were to clear the way, to arrest offenders, and sometimes execute judgment on them.

Liddell, HENRY GEORGE (b. 1811), the Greek lexicographer, was educated at Charterhouse and Christ Church, Oxford. In 1833 he took a first class both in classics and mathematics, and in 1845 was made Professor of Moral Philosophy. From 1846 to 1855 he was headmaster of Westminster, and from 1855 to 1892 Dean of Christ Church. The first edition of the Greek lexicon which he compiled with Dr. Scott, afterwards Master of Balliol and Dean of Rochester, came out in 1843, and soon became a standard work. Dr.

Liddell, who was Vice-Chancellor from 1870 to 1874, also wrote a *History of Rome*. He died in 1898.

Liddon, HENRY PARRY (1829-90), was born in Hampshire, and educated at King's College school and at Christ Church, Oxford. From 1854 to 1859 he was Vice-Principal of Cuddesdon Theological College, and in the latter year returned to Oxford as Vice-Principal of St. Edmund's Hall. Here his lectures on the New Testament were crowded, and his University Sermons were largely attended. It was in 1866 that he first gained a wide reputation by his Bampton Lectures on the Divinity of Christ. In 1870, when he was created D.C.L., Liddon was appointed Ireland Professor of Exegesis, and also Canon of St. Paul's. His sermons in the great cathedral were for twenty years one of the features of London life. In 1876 he and Canon MacColl played a notable part in the agitation concerning the Bulgarian atrocities, and in 1881 and the following years he defended the position of the Ritualists. In 1886 he was elected Bishop of Edinburgh, but declined to accept the position, as he had previously tentative offers of English sees. He began a *Life of Pusey*, but only three volumes had been completed when he died.

Lie, JONAS (1833-1908), Norwegian novelist, born at Eker. He practised as an advocate for some years before adopting literature as his career. His chief novels were *The Man with the Second Sight* (1870), *The Pilot and his Wife* (1874), *The Family at Gilje* (1883), *Married Life* (1887), and *Maisa Jons* (1889), and described Norwegian domestic life. Lie also wrote some poems, short stories, and a comedy, *Graham's Cat* (1880).

Liebig, JUSTUS, BARON VON (1803-73), the great German chemist, was born at Darmstadt, where his father was a drysalter. He studied chemistry at Bonn and Erlangen, and took the degree of Ph.D. at the latter, after which he was sent to Paris at the expense of the Grand Duke of Hesse. Here he became the pupil of Gay-Lussac and the protégé of A. von Humboldt. The influence of the latter obtained for him in 1824 a professorship of chemistry at Giessen. Liebig made Giessen the first school of chemistry in Europe. In his laboratory, the first of its kind, were trained most of the great chemists of the century. In 1845 he was created Freiherr, or Hereditary Baron, and in 1852 left Giessen for Munich. Here, besides being Professor of Chemistry, he was after 1860 President of the Academy of Sciences. He was the founder of agricultural chemistry, made important contributions to animal physiology, and in pure organic chemistry determined the constituents of acids, elicited for the first time chloral and chloroform, and discovered the compound aldehyde.

Liechtenstein, a small independent principality situated between the Vorarlberg and Switzerland. Its total area is only 61 square miles. It belonged to the German Confederation till its dissolution in 1866. The Liechtenstein Legislative Assembly consists of 15 members, of whom 3 are nominated by the Prince and the rest elected by the people. The principality belongs to the Austrian

Customs' and Postal Union. The inhabitants of the capital (now Liechtenstein, formerly called Vaduz) are exempt from military duty. The present Prince has estates in Austria and Germany, and is an Austrian political leader.

Liège (Flemish, **LEICH**), one of the chief towns of Belgium, stands at the junction of the Meuse and Ourthe, 16 miles S.S.W. of Maestricht, and 56 miles by road E.S.E. of Brussels. The old town is on the left bank, the new town on the right bank of the Meuse. The feudal rulers of Liège up to the time of the French Revolution were the Prince-Bishops, who in the 14th century became Princes of the Empire. Continual struggles went on between them and the citizens which led to much bloodshed. In 1467 and 1468 Charles the Bold of Burgundy assisted the Prince-Bishop to subdue the citizens, whose attempts at independence were secretly encouraged by his rival Louis XI. of France. In 1650 a strong citadel was built overlooking the left bank of the Meuse, and the town was effectually bridled. It was bombarded for five days by the French in 1691, was taken by Marlborough in 1702, and again by the French in 1792. Although the old cathedral of St. Lambert was destroyed by the revolutionists in 1794, Liège is still rich in churches. St. Paul's, which has a fine pulpit carved by Geefs, has taken the place of St. Lambert. Holy Cross, founded in the 10th century, belongs chiefly to the 12th and 14th. Other churches are St. Jacques, a 10th-century building, with a polygonal choir; St. Martin, an old church, which was rebuilt in the 16th century; and St. Barthélemy. The 16th-century palace of the Prince-Bishops is now used for law courts and university buildings. The university of Liège is a flourishing institution of the early 17th century, having a school of mines and several other educational institutions attached to it. The city is strongly fortified and adorned by numerous handsome bridges. It is the centre of a great mining district, coal being found under the city and the river. More firearms are made here than in any other town in the world, and there are manufactories of wool, leather, machinery, and steel and iron goods. The city and episcopal territories became a part of Belgium in 1831. The province of Liège, having an area of 1,117 square miles, has Limburg on the N., and Luxemburg on the S. Its principal industries are woollen manufacture and mining; carrier pigeons are also reared.

Liegnitz, a town in Silesia, 38 miles W.N.W. of Breslau. In the 12th century it was the residence of the Dukes of Lower Silesia, and was for four centuries afterwards the capital of a small principality. Its vicinity has been the scene of three great battles, that of Wahlstadt, where in 1241 the Mongols defeated the Poles, of a victory over the Austrians by Frederick the Great in 1760, and of Blücher's victory on the Katzbach in 1813 during the War of Liberation. The modern town has iron-foundries and potteries, makes pianos, and manufactures woollens, cloth, hats, etc.

Lien (from the French *lien*, a "tie" or "band"), is a right in one person to retain that in his or her possession belonging to another till certain demands

of the holder or person in possession are satisfied. Liens arise either by express contract, by usage of trade, or where there is some legal relation. (1) Where by *express contract* it is simply pawn, mortgage, or pledge, which are then the most appropriate terms; or it is an agreement (such as that between principal and factor) that goods intrusted by one person to another for the purpose of sale or for some other purpose than pledge, may be retained by the party intrusted with them as a security for any debt or balance due from the other; or it is an agreement that he may retain the proceeds of things intrusted to him to sell for the same purpose. (2) *The lien by usage*. The "usage of trade" is evidence from which contract is to be implied; parties who mutually act in conformity to a custom have in effect, though not in form, made a contract. (3) The term *legal relation* is only another mode of expressing the mutual rights and duties of the same parties, who by their acts have brought themselves within the limits of a custom, and so shown an intention to make a contract. Thus an inn-keeper has a lien upon the horse of his guest which he takes into his stable to feed. Lien, unless by express contract or custom to the contrary, must from its nature be *particular*, that is, must have reference to a particular transaction and to a particular thing. Where it is general, that is, exists with respect to other transactions also, there must be express contract, or the dealings of the parties must be such as to create that implied contract which arises from acts done in conformity to well-known usage. A lien may be lost by voluntarily parting with the thing, or by express agreement, or by agreement to be implied from acts. In general, one who has a lien for a debt waives it by taking security. The doctrine of lien continually gives rise to numerous and intricate legal questions.

Lieutenant, one holding the place of another, an officer holding a secondary position, *e.g.* in the army, a lieutenant-general, or an officer next in rank to a general; in civil life, a lieutenant-governor or an officer next in rank to a governor. The term lieutenant is more specially applied without qualification to certain officers of the army and navy: in the army, to a subaltern officer in rank next below a captain, and equal in rank to a sub-lieutenant in the navy; in the navy, to an officer next in rank below a commander, and equal in rank to a captain, or (if of eight years' seniority) to a major, in the army. In the navy, a lieutenant is third in command of a battleship, second in command of a corvette or sloop, and, as a rule, the commanding officer of any smaller craft. [FLAG LIEUTENANT.] Ships in the navy carry from one to six lieutenants, or even more; and in all large ships are lieutenants specially qualified for gunnery and torpedo work, while, unless there be a commander for navigating duties, there is also a lieutenant specially appointed for navigation.

Life, the subject-matter of biology, has never, perhaps, been satisfactorily defined. One of the earliest, simplest, and best definitions is that of St. Thomas Aquinas, that life is self-movement. Haeffland's "life is the activity of the organic

forces," explains little; Bichat's, "the sum-total of the forces which resist death," is purely negative; Fichte's, "the self-sustentation of the organism," is very narrow and one-sided, applying solely to vegetative growth, and Duges's, "the special activity of organised bodies;" and Beclard's, "organisation in action," seem hardly maintainable in the face of the absence of organisation in the lowest animals, such as amoeba. Schelling's, "tendency to individuation," refers rather to structural development than to the vital functions of a mature organism, and might include crystallisation; and Richerand's, "a collection of phenomena which succeed each other during a limited time in an organised body," applies equally to decomposition after death. De Blainville's, "the twofold internal movement of composition and decomposition, at once general and continuous," expresses, as Mr. Herbert Spencer points out, only vegetative life, and is equally applicable to a galvanic battery. Three better and closely-allied definitions are those of Cuvier, Schopenhauer, and Lewes. Cuvier's, "the capacity of the organism for assimilating external elements, and preserving its own identity," refers too exclusively to nutrition. Schopenhauer's, "that condition of a body in which it preserves its essential form, whilst the matter of which it is composed is constantly changing," also too much ignores active life, such as that manifested by muscular and nervous action. G. H. Lewes's, "a series of definite and successive changes, both of structure and composition, which take place within an individual without destroying its identity," seems to deny the obvious fact that many vital processes are not successive but simultaneous. Mr. Spencer first suggests, "the co-ordination of actions," and then, in order to exclude the action of a glacier, for instance, "the definite combination of heterogeneous changes, both simultaneous and successive." He then points out that we commonly recognise the living by its giving a fit response to an external stimulus, the tree budding or the animal shrinking from the touch, and adds the words "in correspondence with external co-existences and sequences" to his first definition, which he then abbreviates into "the continuous adjustment of internal relations to external relations," a formula little more suggestive of any adequate conception of life than that of Schelling. The facts that life is always manifested in the presence of protoplasm (q.v.) which has been termed "the physical basis of life," a spontaneously decomposing complex admixture of compounds of carbon, hydrogen, oxygen, nitrogen, and sulphur, saturated with water; that living bodies possess the two great powers of assimilation and reproduction, and that they have generally curved outlines, if not also a definite form and some organisation or differentiation of parts, have been dealt with further under BIOLOGY (q.v.).

Life-Belt, a small jacket of canvas, partially covered with slabs of cork, and worn close under the arms, its object being to support a man in water. The regulation naval life-belt weighs 5 lbs., and has a buoyancy of 20 lbs.

Life-Boat, any boat made with special and unusual provision for buoyancy and righting power; particularly one intended for the preservation of life from shipwrecked vessels. The construction of such a boat was first suggested by the subscribers to the News Room at the Law House, South Shields, in 1789, after the terrible loss (with all hands) of the *Adventure*; and, many plans having been offered, Mr. Greathead's was unanimously accepted, and a boat on that principle was completed in 1790, and during the following 21 years saved 300 lives off the mouth of the Tyne. Numerous other boats on the same system were soon built, and Mr. Greathead was deservedly rewarded by the British and several foreign Governments. All subsequent life-boats designed to be despatched from the shore may be regarded as improvements upon his. [NATIONAL LIFE-BOAT INSTITUTION.] Ship's life-boats are boats suited for rowing, sailing, or steaming, as the case may be, and fitted with air-chambers to conduce to buoyancy, but not externally differing to any great extent from other ship's boats.

Life-Buoy, any buoyant object intended for the support of a man or men in the water, and capable of being thrown or detached from a ship or pier into the sea. The naval service life-buoy, which is supposed to be capable of keeping four men afloat, is fitted with a portfire, which lights itself automatically and burns for 20 minutes, so as to indicate the position of the buoy in darkness. The ring-shaped cork life-buoy is, however, a commoner and more familiar form. Buoys of similar shape are sometimes made of rushes covered with canvas. There are many other types of life-buoy, some of which contain supplies of food and water sufficient for the maintenance of life for a week.

Life-Saving at Sea. [LIFE-BELT, LIFE-BOAT, LIFE-BUOY, etc.]

Lifts may be worked by steam, gas, manual, or hydraulic power. A cage is arranged to be movable up or down a rectangular shaft, and in the case of non-hydraulic lifts is suspended by manilla or steel ropes or chains, which are passed over a grooved pulley at the top of the shaft, and support a weight which approximately balances the cage. The pulley may be rotated to raise the cage by means of belt or spur gearing from a countershaft driven by an engine, suitable mechanism being provided for reversing the motion for lowering or putting on the brake when the cage is stationary. In manual lifts a second rope, connected to the first by spur gearing, can be rotated by a long rope passed round it, by pulling which the gear can be driven in either direction. In some hydraulic lifts a long rod which supports the cage acts as the plunger of a cylinder sunk in the ground; water under pressure being admitted through a valve, the plunger is forced upwards, while a valve which allows the water to escape provides for the lowering of the cage. Owing to the difficulty of sinking the cylinder in a pit, telescopic cylinders are sometimes used, or a short cylinder acts on a chain supporting the cage through pulleys so arranged that a small motion of

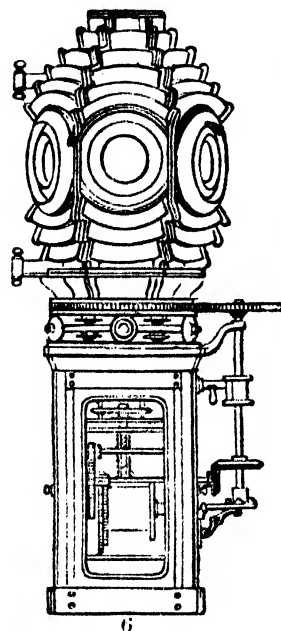
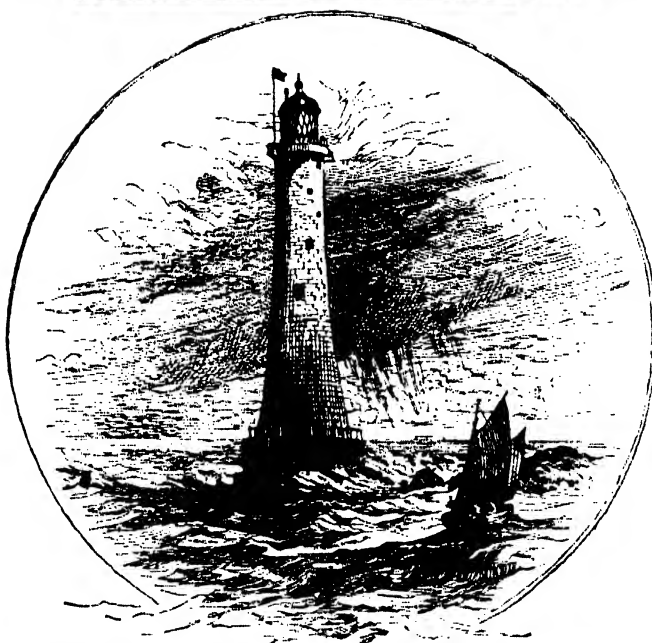
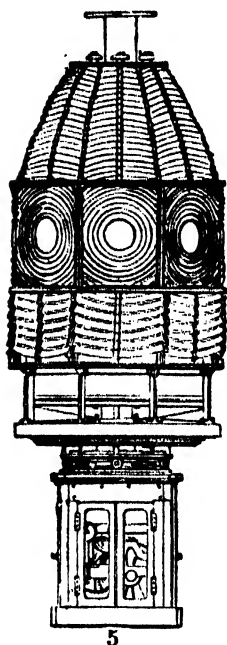
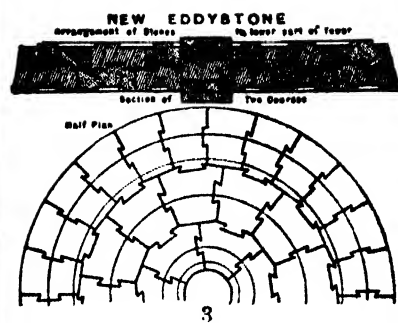
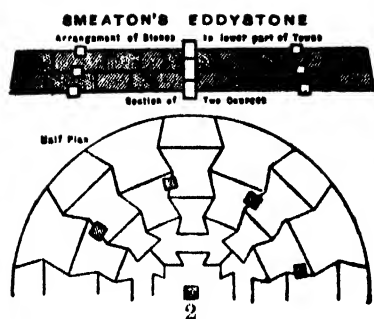
the ram produces a relatively large motion of the cage. In all power lifts a rope which controls the gearing or valves hangs down inside the shaft, and is accessible from the cage.

Ligament, a band of connective tissue which serves to unite and bind together certain animal structures. Ligaments are typically developed in joints, and the tendons which serve to connect muscles with bones are modified ligaments. Ligaments are usually composed of white fibrous connective tissue, but in some cases—as, for example, in the ligamentum nuchæ, which attains to huge proportions in the neck of the ox, horse, etc.—yellow elastic tissue forms the basis of the structure.

Ligan, goods which are cast into the sea, but which have been tied to a buoy or cork that they may be found again. [FLOTSAM.]

Light, LIGHTING. Light is a special effect on special sense-organs that are possessed by the more highly-developed animal organisms. The nerve matter that most readily appreciates light is concentrated in the eye (q.v.), though other parts of the body may in certain cases be susceptible. It is better to regard light as the effect, rather than the cause, since the same cause may in one case produce the effect of light and in another case, equally normal, no such effect. For this cause is essentially a vibratory motion possessed by the particles of all the matter with which we are acquainted, and by the ether (q.v.) which permeates all space that is not absolutely occupied by these particles. Given such a particle in an isotropic material, its motion would be transmitted to the surrounding particles by spherical waves that would undulate through the substance, in the same sort of way that a particle of water oscillating on the surface of a smooth pond transmits its motion by circular waves. That portion of the human eye (q.v.) known as the *retina* is directly affected by these vibrations, provided that they are sufficiently intense, and that the frequency of the wave lies within certain limits. No effect of light is produced when the intensity is insufficient or when the frequency is outside the given limits. Excessive intensity may permanently damage the retina, as is sometimes the case with lightning flashes. The ordinary limits of frequency are 400 to 750 billions per second. Waves outside these limits may be appreciated by their heating or other effects, but not by the sense of sight. The difference of effect of waves of different frequencies is that of *colour* (q.v.). Waves with a frequency of about 400 billions per second affect the eye as red colour, those of 750 billions as violet colour, and intermediate frequencies give the range from red, through the orange, yellow, green, blue and indigo, to the violet. If a body is emitting waves of all these frequencies in a certain proportion, the effect on the eye is complex and the colour is called white. Such mixed light may often be resolved into its constituent colours, as in spectrum analysis (q.v.), and its complexity demonstrated. Waves of different frequencies appear to travel through the same medium at the same rate, though the rate varies with the medium. The speed in a vacuum is about

186,000 miles per second. Light cannot penetrate wood of any great thickness; such a substance is termed opaque. It can pass through clear glass readily without irregular deformation of the waves; such a substance is called *transparent*. Through opal glass light can certainly pass to some extent, but the passage is irregular and the emerging waves give no notion of the form they possessed before entering the glass; such a substance is *translucent*. When light waves impinge against the surface of an opaque substance there occurs a certain amount of absorption, the particles of the substance taking up the motion, and also a portion is reflected back. Polished silver absorbs extremely little and reflects nearly all the light that strikes on it. Lampblack absorbs practically all, and reflects none. Even transparent substances reflect a small amount of light from their surfaces. The shape of the reflecting surface may be made so as to concentrate the return-wave to a point, or to cause it to diverge more, or to send it back with just the same form as it possessed before striking the reflector. The last case is effected with plane mirrors; the other two with concave or convex mirrors. Similar changes of form of wave-fronts may be effected by the passage of the waves into transparent media, the most usual arrangements to effect such results being lenses (q.v.). The practical question of the supply of light by artificial or natural means is of much importance, but only recently has a clear knowledge of the deficiencies of present systems been obtained. The natural source of light is the sun and, for the most part, it is also indirectly the source of artificial light. The combustion of various materials may give a high intensity of temperature [HEAT], but this in itself is not sufficient. It is necessary that the radiation from the hot substance shall consist in part of waves corresponding to certain frequencies between the limits before mentioned. Even within this range the intensity of illumination varies greatly with the frequency of the waves. When a substance is heated sufficiently, either by its own combustion or by other means, a mixture of waves is emitted, not all of which lie within the desired limits. Those that do not are wasted, so far as illumination is concerned. Perhaps they may supply much heat, or, indeed, they may be so intense as to effect chemical decompositions that ordinary sensible heat cannot perform. But from the present point of view they are waste products, and it becomes necessary either to avoid their production, or else to transform them into light-giving waves. Of all the energy stored up in coal used for gas manufacture, energy represented by the separation of carbon from oxygen by prehistoric action of the sun's radiant energy on living vegetable matter, not one per cent. is converted into light radiation when the ultimate coal-gas is burnt in air. If, instead of being produced by burning of gas, the light is produced by the sufficient heating of a carbon filament or of carbon vapour through the passage of an electric current, the resulting illumination has advantages in quality which render it more desirable. But still it is a mixture of useful and useless radiation, and fully 90 per cent. of the energy of



LIGHTHOUSES.

the original coal is lost in the steam-engine and dynamo-electric machinery (q.v.), before being converted into the energy of electric current. The two main points to consider, if we wish to economise the rapidly-diminishing supply of coal in the world, are: (1) how to transform the potential energy in the coal into vibratory energy of one frequency only, and (2) how to alter the one frequency without waste into another that gives light. When any metal, *e.g.* sodium, is burnt, there is certain production of light of definite and constant frequency; to obtain this alone would be a solution of the two problems applied to expensive sodium instead of relatively inexpensive coal. The phenomena of fluorescence (q.v.) and of calorescence (q.v.) offer suggestions for the solution of the second problem, and possibly the invention of a cheap electric battery of coal would be the main step towards that of the first.

Light and Air. [EASEMENTS.]

Lightfoot, JOSEPH BARBER (1828-89), was the son of a Liverpool accountant. He was educated at King Edward's school, Birmingham, and at Trinity College, Cambridge. He was elected a scholar of his college in 1849, a fellow in 1851, and a tutor in 1857. He was senior classic (1851), first Chancellor's medallist, and a wrangler. He was ordained in 1854, and in 1861 was elected Hulsean Professor of Divinity. His lectures on the New Testament were crowded beyond precedent. In 1862 he became chaplain to the Queen and examining chaplain to the Bishop of London, but refused to stand for the Regius Professorship of Divinity at Cambridge in 1870. Five years later, however, he accepted the Lady Margaret professorship. In 1871 he was appointed Canon of St. Paul's, having in 1867 declined the see of Lichfield. In 1879 he accepted that of Durham, and continued to spend the whole of his episcopal income in the diocese till his death.

Lighthouse, a conspicuous building carrying at night a light for the warning or guidance of mariners. Lighthouses were of very early adoption, and were at first merely towers with open fires upon their summits. Candles, and then oil lamps, behind glass were next used. Oil lamps are still retained in many localities, but are supplemented with scientifically-constructed lanterns and powerful reflectors or refractors, and elsewhere gas or electricity supply the illumination. Simple concave mirrors were originally used to direct the light, spherical parabolic mirrors were next employed. All systems by which the light is thus reflected are termed "catoptric." Early in the 19th century Fresnel introduced the "dioptric" or refracting system of lenses, by the use of which the light is much economised. He also introduced the "catadioptric" system, whereby mirrors and lenses are combined. The "holophotal" system of Mr. T. Stevenson causes the rays from the side of the flame opposite to the mirrors or lenses, as the case may be, to fall upon a series of prisms, from the internal surfaces of which they are reflected back through the lenses. The lights of different lighthouses are distinguished by their colour, by their nature or

intensity, or by their periodicity if they be revolving; and they can thus be easily recognised. Those on the coasts of the United Kingdom number about five hundred. English lights are under the Corporation of the Trinity House [TRINITY HOUSE], Scottish ones under the Commissioners of Northern Lights, and Irish ones under the so-called Ballast Board, or Corporation for Preserving and Improving the Port of Dublin; but all are subordinate to the Board of Trade. Among celebrated British lighthouses are the Eddystone (q.v.), and the following: Smalls Rock, built of wood in 1776, and of granite in 1861; Maplin, built on iron screwed piles in 1838; Bishop Rock, completed in 1858, and raised and altered in 1889; St. Catherine's, built in 1780, reduced in 1840, and furnished with electric light in 1883; Inch Cape, or Bell Rock (1811); Skerryvore (1844); North Uist (1858); Dhu Heartach (1872), and the Belle Tote, erected at Beachy Head (1831).

Lightning is a large electric spark. In 1752 Franklin of Philadelphia discovered that thunderclouds were always electrified. This he did by sending a kite up into the cloud, and conducting the electricity down the string, and from this experiment he conceived the idea of protecting buildings by wire conductors, down which the electricity could be carried safely away. How it is that the clouds get electrified is not thoroughly known, but it is generally supposed that a certain amount of electricity is produced by friction between the lower clouds, or mists, and the rocks against which they are driven. When rain frequently falls, the charge is carried down, but after dry weather the charge accumulates, and lightning results. The flash takes place either between two clouds, or a cloud and the earth, the air really giving way under the electric strain. The break occurs at the weakest spot, and this will be where some high point on the earth is stretching out towards the clouds; forked lightning then occurs. Another flash often immediately follows the first, and this is known as the "back stroke." "Summer lightning" is generally due to a storm a long distance away. "Globe lightning," or "fire-ball," is not quite understood; it generally lasts several seconds, is less brilliant than forked lightning, and often bursts on reaching the ground, discharging flashes of lightning. The brightness of lightning is very great, but so quick is the flash that it is not fully observed; if it could be made to last even one-tenth of a second, it would be found to be 100,000 times as bright as moonlight. The curious odour noticed during a thunderstorm is due to the formation of ozone by the electric discharge.

Light Ship, a stationary vessel bearing a light, and moored for the benefit of mariners on any spot where, owing to the nature of the bottom, or to other causes, a lighthouse cannot be erected.

Lights, SHIPS', the lanterns carried by ships in order to indicate their nature and movements to other ships at night. A starboard light (green) and a port light (red) are ordered to be carried by all ships when under weigh, and to be so screened as

to throw their beams from right ahead to two points abaft the beam. They should be sufficiently powerful to be visible from a distance of two miles. A steamer under weigh carries a masthead light which throws its beams from right ahead to two points abaft the beam on each side, and which should be visible in clear weather from a distance of five miles. A steamship towing another ship carries two bright white masthead lights disposed vertically, in addition to side-lights. A ship being towed carries side-lights only. Sailing pilot vessels carry a white masthead light visible all round, and also exhibit a flare-up light every fifteen minutes. Fishing vessels and boats at anchor exhibit a bright white light. Boats fishing with drift nets carry on one of their masts two lights, one three feet above the other.

Lignine Dynamite, or **LIGNOSE**, is a generic term for mixtures of nitro-glycerine with sawdust or wood-pulp, whether nitrated or not. In some forms nitrates are also added. Lignine dynamites were the explosives chiefly favoured by the Irish-American dynamiters.

Lignite, or **BROWN COAL**, a rock of vegetable origin, generally retaining some of its original fibrous structure, yellow or pale brown to dark brown or black, with a specific gravity of 0.5 to 1.5, burning with a sooty flame, and often with a sulphurous smell, and leaving a good deal of ash. It contains from 55 to 75 per cent. of carbon, and is thus in all respects intermediate between peat (q.v.) and true coal. It varies in some characters according to its matrix. In the Lias and Kimeridge clays coniferous plants yield compact *jet* or *Kimeridge coal*, black, lustrous, and not fibrous; whilst in porous Jurassic limestones, rafts of drift wood still retain a brown colour, and much fibrous structure. In the Lower Eocene Laramie beds of the Rocky Mountains, our own Woolwich beds, the Oligocene Brown-coal beds of North Germany and the Lower Rhine, the Swiss Molasse and the Spitzbergen Miocene coal, the lignite, which is often black and lustrous, though largely coniferous, also consists largely of angiospermous plants. In North Germany it forms the chief fuel of the country.

Lignum vitæ. [GUAIACUM.]

Liguori, **ALFONSO MARIA DE'** (1696-1787), a saint of the Roman Catholic Church, was born near Naples. He took a degree in law when only sixteen, and had a large practice at the bar, but in 1724 took holy orders. In 1732, having in the meantime gained a high reputation as a preacher, he founded "The Congregation of the Most Holy Redeemer," a society whose chief work was to be the education of the poor. Their "rule" was confirmed by Benedict XIV. in 1749. In 1762 Liguori, who had refused the archbishopric of Palermo, became Bishop of Sant' Agata dei Goti, but resigned his office in 1775 and retired to Nocera dei Pagani, the head-quarters of his order. He was canonised in 1839, and declared a Doctor of the Church by Pius IX. His *Moral Theology* is still in use among Romanists, and his casuistical treatises are also highly valued by them. The

Liguorians or Redemptorists have houses in Germany, Switzerland, and Austria.

Li Hung Chang, a distinguished Chinese statesman, was born in 1823. He assisted General Gordon in quelling the Taiping rising in 1860, and has held several high offices since then, being at one time Viceroy of China. He played a very prominent part in the events of 1900. He died in 1901.

Lilac (*Syringa vulgaris*), a favourite shrub in our gardens, supposed to be of Persian origin. It belongs to the Olive family, growing from 4 to 15 feet high, with opposite entire acute leaves, and large terminal pinnacles of pink or white flowers. The calyx is small, four-toothed and persistent; the corolla salver-shaped with a long tube and four limb-segments; the stamens two, sessile in the corolla-tube; the style bifid and included; and the fruit, a two-chambered, four-seeded capsule. There are numerous slight variations in cultivation, and *S. Josikaea* from Transylvania has flowers which, very unlike those of the other forms, are scentless.

Lille, the ancient capital of Flanders, and at present the chief town of the department of the Nord, France, is 155 miles N. of Paris by rail. Its name is a variant of L'Isle, the old castle being surrounded by marshes. It first became important in the 12th century, but was destroyed by Philip Augustus in 1212. A hundred years later it was ceded to France, but at the end of the 14th century it became Burgundian, and was the residence of Philip the Good. It remained in the possession of various branches of the Hapsburg family till taken by Louis XIV. in 1667. In 1708 it was captured by Marlborough, but in 1792 it successfully sustained a bombardment of nine days from the Austrians. Lille is an important manufacturing town, the spinning of flax employing thousands of hands. There are also woollen, cotton, thread, and damask factories, a state tobacco manufactory, and chemical and dye-works. The chief institutions are a Catholic university, an academy of music, a good picture-gallery, and the Wicar Museum containing original designs of Italian masters. The Communal library has valuable manuscripts.

Lillo, **GEORGE** (1693-1739), an English dramatist, was born in London. He followed his father's trade, but in 1730 made his reputation as a dramatist by *The London Merchant; or, the History of George Barnwell*. In 1796 Mrs. Siddons and Charles Kemble played in it at Covent Garden. Another play by Lillo, *Fatal Curiosity*, brought out by Fielding at the Haymarket in 1736 or 1737, was also highly popular.

Lilly, **WILLIAM** (1602-81), the astrologer, the Sidrophel of *Hudibras*, was the son of a small farmer of Leicestershire. In 1620 he went to London, and seven years later married the widow of Wright, his employer, and inherited his property. He first turned his attention to astrology in 1632, and in 1644 published the first of his 36 annual almanacks containing predictions of the events of the year. He brought out a "nativity"

of Prince Rupert in 1645, of Strafford and Laud in 1646, and of the King of Sweden in 1659. Some of these almanacs were translated into German, Dutch, and Danish. Lilly pretended to be a Parliamentarian, and in 1648 was asked to attend the siege of Colchester in order to encourage the Parliamentary soldiers by his predictions. In 1651 his *Monarchy and no Monarchy* declared that England should no more be governed by a king; but he got into some trouble two years later by predicting that the Commons and soldiers would combine to overthrow Parliament. At the Restoration he was taken into custody and examined by a committee of the Commons as to his knowledge of the particulars of Charles I.'s execution, but was soon set at liberty. From 1670 till his death Lilly practised medicine.

Lily, a popular name applied to a variety of plants, mostly monocotyledons, with fleshy and generally white flowers, but often not otherwise related, including the various species of the genus *Lilium*, which gives its name to the order Liliaceæ. *Lilium* has a scaly bulb; leaves on its erect stem; and a flowered raceme of large flowers, with a perianth of six segments, distinct or nearly so, always somewhat (often strongly) reflexed; six free stamens with versatile anthers, a three-chambered, many-seeded, superior ovary, elongate style, and tri-lobed stigma. This genus includes *L. candidum*, the old-fashioned white or Annunciation Lily of painters; *L. Martagon*, the Turk's-cap Lily; *L. bulbiferum*, the Tiger Lily, with orange flowers; and the magnificent *L. auratum* of Japan, with white perianth segments studded with crimson points, and each having a median band of yellow. The *water-lilies* (q.v.) are very different plants, dicotyledons belonging to the family Nymphæaceæ. The *Lily-of-the-valley*, *Convallaria majalis*, a British species, though belonging to the Liliaceæ, is far removed in affinity from *Lilium*. It has a long slender rhizome, whence rise branches bearing two broadly-lanceolate leaves, and a drooping raceme of a few small white bell-shaped flowers, with coherent perianth-segments. The fruit, moreover, is baccate, and not, as in true lilies, capsular. *St. Bruno's Lily*, *Anthericum Liliastrum*, is also liliaceous, but not bulbous. Its white sweet-scented flowers have a green dot on each perianth-segment. The *Day Lily*, *Hemerocallis*, has a trumpet-shaped orange perianth with united segments, and is also liliaceous. The *Guernsey Lily*, *Nerine sarniensis*, the pure white *Amazon Lily*, *Eucharis amazonica*, the *Scarborough Lily*, *Vallota purpurea*, and the lovely *Belladonna Lily* (so called from its resembling the complexion of a beautiful woman), *Amaryllis Belladonna*, are all members of the order Amaryllidaceæ, differing from the Liliaceæ in having an inferior ovary. So also are our own *Lent Lily*, *Narcissus Pseudo-narcissus*, and the *Whitsun Lily*, *N. poeticus*. The *Trumpet Lily* (known, from pigs eating its corms, as *Pig Lily*, in South Africa), *Richardia athiopica*, so far from being a true lily, is an aroid, with no perianth, but with a white trumpet-like spathe (q.v.) sheathing round the fleshy spadix (q.v.) of minute flowers.

Lilye, or LILY, WILLIAM, classical grammarian, born at Odiham in Hampshire, 1466, graduated at Oxford, and was elected demy of Magdalen 1486. Having taken his degree he went to the East, and at Rhodes learnt Greek from refugees from Constantinople. He then studied Greek and Latin in Rome and Venice. He returned in 1509 and taught privately in London, but was made headmaster of New St. Paul's school by Dean Colet, in whose *Brevissima Institutio* he had a hand. He wrote some Latin poems, and a volume of Latin verse against a rival schoolmaster called *Antibossicon ad Gulielmum Hormannum*.

Lima, the capital of the Peruvian Republic, is situated on the river Rimac about ten miles from the Pacific Ocean. It is 700 feet above sea-level, and has a very picturesque appearance. Earthquakes have laid it in ruins frequently—notably in 1687, 1746 (when 2,980 houses were destroyed, and 19 ships sunk in its port, Callao), 1764, 1822, 1828. Its principal buildings are the cathedral and the Government house, once the palace, where Pizarro was assassinated. Slavery was abolished in 1828.

Limburg, the name of several provinces and places, the most important of which are the province of Limburg in Holland, and the province of Limburg in Belgium, and the town of Limburg in the province of Liège, where the celebrated cheese is made.

Lime (*Citrus acida*), or the variety *acida* of *C. medica*, is an orange with small flowers, and small, very acid, fruit, varying in form but ending, like the lemon, in a nipple-like boss. It is said to have borne the Sanskrit name *jambira*. The *Sweet Lime* of India is *C. Limetta*, or *C. medica* (var. *Limetta*), differing in its spherical fruit, with sweet, non-aromatic juice. It is said to be wild in the Nilgherry Hills, and is now largely cultivated in Montserrat and other West Indian islands. Jamaica exports some 80,000 gallons of lime-juice annually. It is the most valuable of antiscorbutics for long sea-voyages.

Limelight. An oxyhydrogen jet is directed upon a cylinder of quicklime, a portion of which is thus raised to an exceedingly high temperature, and emits a brilliant white light. The flame may be produced by burning a mixture of oxygen and hydrogen supplied under pressure to a suitable jet, or by blowing a jet of oxygen through a flame of burning hydrogen, coal-gas, or alcohol; or by saturating oxygen with vapour of ether or a volatile hydrocarbon, and burning the mixture. The first method is most effective, but both it and the last mentioned are dangerous if proper precautions are not taken. Coal gas and oxygen, with a "blow-through" jet, are most commonly used.

Limerick, one of the six counties of Munster, Ireland, is bounded on the north by the Shannon, on the east by Tipperary, on the south by Cork, on the west by Kerry. Its chief productions are wheat and various grains. Pop. (1901), 146,908. LIMERICK, the capital of the county, stands on the Shannon and has a very ancient cathedral and manufactures of linen, woollen, and paper. In 1651 it was taken by General Ireton. Pop. (1901), 38,085.

Limestone, a rock mainly composed of calcium carbonate (CaCO_3), sometimes nearly pure and entirely soluble, with effervescence, in hydrochloric acid, sometimes mixed with sand, clay, or other impurities, which may form a residual soil after the removal of the carbonate of lime, as in the case of the red clay over Chalk and Oolite districts. Most limestones are of organic origin, and they vary in texture from the *ooze* of Foraminifera now forming in the deep ocean, the soft earthy *shell-marl* formed in fresh-water lakes, the *shell-sand* of coral and nullipores comminuted by shore winds, and the compact but fine-grained marine *chalk* (q.v.), to the concretionary *travertine* of calcareous springs, the *oolite* (q.v.) of still lagoons, *coral-rock*, or *encrinital marble*, which are partly crystalline; and to more compact but granular limestones, others metamorphosed into a completely crystalline or *saccharoid marble*, and the crystalline *stalactite* and *stalagmite* of caverns. Thus in many cases all traces of organic or even plastic origin are obliterated. Marmorisation, or conversion into marble, is often the result of heat, as in the chalk through which basaltic dykes are intruded in Rathlin Island. Dolomite (q.v.) when cavernous is also probably due to the alteration of limestone. Some limestones, such as some of the Carboniferous Limestone in Ireland, are so impregnated with sulphuretted hydrogen, probably from animal matter, as to have acquired the name of *stinkstone*. Limestones which contain a considerable admixture of earthy matter, especially those occurring in nodules in clay, are known from their use as *cement-stone* (q.v.). In colour limestones range from white chalk and marble to cream-colour, as in Bathstone, yellow, brown and red in more or less ferruginous rocks, to blue-grey, as in most Carboniferous Limestone, and to black. Limestones are acted upon by rain water both mechanically and, owing to the presence of carbon-dioxide, chemically. This decomposition, taking place along joints (q.v.), gives rise to caves (q.v.) underground and to the picturesque ravines, buttresses, and pinnacles above ground to which the Carboniferous Limestone owes its name of Mountain Limestone. Besides their employment in building, for roofing or for road-metal, immense quantities of limestone are burnt into quicklime for use in mortar or as a manure.

Lime-tree. [LINDEN.]

Limited Liability Acts, acts which provide that partners in joint-stock companies shall be liable only to the extent of their shares, or some further specified extent, and not to the full extent of their individual means.

Limnocoedium, a small freshwater jellyfish which was discovered in the warm tank of the *Victoria regia* at the Botanic Gardens, Regent's Park, where it is sometimes very numerous. It measures less than half an inch across the disk. Habitat unknown. Only one other fresh-water jellyfish, from Lake Tanganyika, is known.

Limoges, a French city, capital of the department of Haute-Vienne, and formerly of Limousin. It is an episcopal see, and has a fine cathedral, a

palace, and hôtel de ville. Its manufactures are woollen, linen, and cotton goods, and paper, and there are tanneries and iron forges.

Limonite, a name applied generally to the hydrous sesqui-oxides of iron which generally occur in an earthy or other massive non-crystalline form, or diffused as colouring matters through rocks of other composition, varying from *yellow ochre* to brown or even black. It is thrown down from water in marsh-lands where iron sulphide becomes sulphate and happens to co-exist with carbonate of lime in the water (*bag iron-ore*); and it is a common decomposition product of other minerals.

Limulus. [KING-CRAB.]

Linacre, or LYNACER, THOMAS (1460–1524), an eminent physician and priest, was born and received his early education in Canterbury. In 1484 he went to Oxford and, having obtained a fellowship, went to Italy and studied at Bologna, Florence, Padua, Rome. On his return he educated Prince Arthur, Henry VII.'s eldest son. He was first president of the College of Physicians, which he helped to found; nevertheless, he gave up practising, and held several important positions in the Church.

Lincoln. 1. An English city, the capital of Lincolnshire (q.v.), is situated on the river Witham 42 miles S. of Hull. It contains one of the finest cathedrals in England and other interesting buildings, notably the ruins of the castle, the guildhall, and several gateways, one Roman. Its manufactures include agricultural machinery and iron foundries; there is a considerable trade in flour, corn, and wool. It has a large annual horse-fair and race meetings. Pop. (1901), 48,784.

2. The capital of Nebraska, stands on Salt Creek. It was laid out in 1867, and is now a handsome and thriving city, with fine public buildings including the state Capitol, the university, the prison, an asylum, and the United States court-house.

Lincoln, ABRAHAM (1809–65), the sixteenth President of the United States, was born in Kentucky in 1809. In 1816 he moved with his father to Spencer county, Indiana. In 1832, on the rebellion of Black Hawk, he joined a volunteer company and served three months as captain. He next opened a country store which failed, but was appointed postmaster of New Salem. From 1834–40 he was a member of the Illinois Legislature, and in 1836 was licensed to practise law. In 1846 he was elected to Congress. In 1849 and 1858 he was unsuccessful in getting a seat in the Senate. In the Republican National Council (1860) he was nominated candidate for the Presidency, and his election next year, being a triumph for the Abolitionists, brought about the Civil War, in which the success of the North was largely due to the high qualities he displayed as an administrator. He was re-elected President in 1864. On the 14th April, 1865, he was shot at Ford's theatre, Washington, by John Wilkes Booth, and died on the following day.

Lincolnshire, a large county on the east coast of England bounded by the Humber, the German Ocean, and the Wash, and by the counties

of York, Nottingham, Leicester, Rutland, Northampton, and Cambridge. A very large portion of the county is below high-water level, being protected by embankments. The principal rivers are the Trent, Witham, Welland, and Ancholme, and the towns Lincoln (q.v.), Grimsby, Bolton, and Grantham. Pop. (1901), 492,948.

Lind, JENNY (MADAME OTTO GOLDSCHMIDT) (1820-87), a celebrated public singer, "the Swedish nightingale," was trained under Garcia at Paris, and was first successful in Berlin (1845), and subsequently in her native city, Stockholm. She appeared at Covent Garden first in 1847. In 1852 she went to the United States, and there married. After an extensive tour she returned to England and settled. In her later years she seldom sang in public.

Linden, LINE, or in modern times LIME, the English name of a beautiful group of trees, the genus *Tilia*, which gives its name to the order Tiliaceæ. They are large trees with scattered, obliquely-cordate, serrate leaves and clusters of small yellowish flowers, very fragrant and full of honey, with the peduncle adherent to a leaf-like bract. The flowers have 5 inferior sepals, 5 petals, indefinite stamens and a globular 5-chambered, 10-ovuled ovary, which by abortion gives rise to a one-chambered and often only one-seeded fruit. The common linden (*Tilia europæa*) is a native of Europe, the variety *parvifolia* being perhaps indigenous in England; but the commonly-planted *grandifolia* belonging to the south of Europe. Its name occurs in early English place-names, such as Lyndhurst; it is mentioned as a material for shields in the song of Brunanburh; Chaucer writes: "Be ay of chere as light as lefe on linde;" and Shakespeare mentions the tree in the *Tempest*. It was a favourite tree with William III., and many avenues of it were planted by his Whig admirers in England. Its wood is soft but close-grained, and is valued by carvers, turners, and musical-instrument makers. Most of Grinling Gibbons's delicate carving is in linden wood. The bast (q.v.) or inner bark is tough, and considerable quantities of it are imported as Russia matting, chiefly for gardeners' use in tying up plants. The tree is also interesting to botanists as the origin of the name of Linnæus and probably also of Lindley. There is a handsome American species (*T. americana*), with larger flowers and larger leaves, darker above and silvery on their under surfaces.

Line, in *geometry*, is the path traced out by a moving point; if the point always travels in the same direction a *straight line* is produced. A line has only one dimension—it has length, but neither breadth nor thickness.

Linen, a fabric manufactured from the fibres of flax (q.v.). The use of linen cloth dates back to the earliest period of which there is any historical record. Flax and linen are mentioned in Genesis and other books of the Old Testament, and there yet remain linen cloths, often extremely fine in texture, which were used as winding-sheets for the embalmed Egyptian mummies. Spinning and

weaving were known to the Greeks and Romans at a very early date, and were probably introduced by the latter people into all the European countries which formed part of their empire. From the beginning of the Middle Ages to the latter part of the 18th century the manufacture of linen continued to occupy an important position amongst the domestic industries of Europe. It appears to have taken root in Flanders about the 11th century. It also flourished vigorously during the Middle Ages in the north of France, where it still holds its ground. Its progress in the United Kingdom was much furthered in the 17th century by the immigration of Huguenot refugees. The decline of the industry began in the last quarter of the 18th century, chiefly through the success of the machinery adopted in the manufacture of cotton. The cotton trade thus gained an ascendancy which it has ever since retained, mainly owing to the greater cheapness of cotton and to the extreme adhesiveness of the gum in flax-fibres, which makes spinning difficult. Like other industries which were pretty generally diffused before the introduction of the factory system, the linen manufacture is now confined to certain well-defined areas. In the United Kingdom the finest linens are produced in the north of Ireland, especially at Belfast and other places in the neighbourhood, which are noted for linen and cambric handkerchiefs, damask table-linen, and similar fabrics. Linen damasks, diaper towelling, and other goods of the same kind are woven in Fife and in Yorkshire. Sailcloth and other heavy linen goods are produced extensively at Dundee, Arbroath, and elsewhere in the county of Forfar. Abroad the industry is almost wholly confined to France, Belgium, and Germany. The French damasks and cambrics have acquired the greatest renown.

Line of Battle. 1. The formation of a fleet of battleships when ready to engage an enemy. 2. The class of vessels designed to participate in a general engagement. This class anciently included vessels of 64 guns and upwards—i.e. those of the first, second, and third rates—and it now includes all armoured sea-going ships that are not classed as "cruisers."

Lines of Force, in magnetism, are imaginary lines representing the direction and magnitude of the resultant force at any point in a magnetic field. If fine iron filings are sifted on a card held over a magnet they arrange themselves along these lines, which invariably form closed figures. The action of one magnet upon another is such that they appear to have a tension in the direction of their length and a pressure at right angles to it; hence they tend to shorten themselves, which occurs when two unlike poles are attracted and approach each other. Any combination of magnets and currents tends to arrange itself so that the lines of force due to all are in the same direction and as short as possible. In the C.G.S. units 411 lines of force proceed from unit magnetic pole.

Ling (*Molva vulgaris*), an important food-fish of the Cod family, common on the northern coasts

of Europe, Iceland, and Greenland, and taken in great numbers with trawls and lines round our shores. It differs from the Hake (q.v.) in having a barbule beneath the chin, and there are several large teeth on the lower jaw and on the vomer. There are two dorsal fins and one anal; the body is greatly elongated, greyish-olive above, silvery-white below, and the fins are edged with white. The general size is from three feet to four feet, but much larger specimens have been taken. Most of the fish caught are dried as stock-fish; and large quantities, in this state, are exported to Spain. The swim-bladders are dressed as sounds, the roes are dried, and from the liver is prepared an oil used for illuminating purposes and sometimes in medicines.

Linga, LINGAM, the symbolic pillar by which the Sivaites represent the Phallus (q.v.). The term *yoni* denotes the mystic oval symbolising the female, or productive power in nature.

Lingard, JOHN (1771-1851), a Roman Catholic writer of great distinction, was born at Winchester. He was educated at Douay, and, after being ordained priest, undertook clerical duties at Newcastle, where he republished (1805) a series of letters contributed to a periodical under the name of *Catholic Loyalty Vindicated*. His other works were *Antiquities of the Anglo-Saxon Church* and *The History of England from the Invasion of the Romans to the Year 1688*, in six vols. 4to (1817-25). Dr. Lingard refused a cardinal's hat. In 1811 he went as mission priest to Hornby, where he died.

Linguatulida, an aberrant order of the Arachnida (Spiders), much degenerated through their parasitic mode of life. The body is wormlike, there are no jaws, and the limbs are only represented by two pairs of hooks near the anterior end. They occur in the bodies of various warm-blooded animals.

Liniments are preparations designed for outward application by rubbing into or smearing over an affected part. Soap liniment, compound camphor liniment, and the liniments of aconite, belladonna, and opium are examples of this form of application. Most of the liniments contain camphor, partly to indicate that they are not intended for internal use.

Link Motion in the steam-engine (q.v.) is an arrangement for varying the amount of motion of the slide-valve that opens and closes the steam-ports leading to the cylinder. The two extremities of the link are made to oscillate backwards and forwards in opposite directions, and a block capable of sliding along the link will take up a motion compounded of these two and depending upon the position of the block. This actuates the slide-valve by means of the valve-rod; and the valve, by shifting the block along the link, may have its motion increased or diminished or entirely reversed. [STEAM-ENGINE.]

Links, a stretch of level or undulating ground on which a golf course is played.

Link-work. [PEAUCELLIER CELL.]

Linley, THOMAS (1725-95), a celebrated English composer, was born at Wells, and studied under Paradies, a famous foreign baritone. He began his musical career by conducting oratorios at Bath, until, by the advice of his son-in-law Sheridan, he came to London, where he gave performances of Handel with Dr. Arnold for some time, and then became one of the proprietors and managers of Drury Lane theatre. His compositions include the music of Sheridan's *Duenna* and of the *Beggar's Opera*, *Gentle Shepherd*, *Carnival of Venice*, etc., besides various vocal pieces. *

Linlithgow, or WEST LOTHIAN, a county in Scotland, lies between lat. 55° 49' and 56° 1' N., and long. 3° 18' and 3° 51' W., and contains about 81,100 acres. It is very rich in minerals, including coal, shales, freestone, ironstone, and its principal manufacture is paraffin oil. Pop. (1901), 65,708. Linlithgow Lake, 102 acres in area, is famous for its curling and skating. The towns are Linlithgow (the capital), Bathgate, Queensferry, Borrowstowness.

Linnaeus, CAROLUS, or KARL VON LINNÉ (1707-1778), the great Swedish botanist, who founded the *artificial* system of classifying plants, which has been superseded by the *natural* system of Jussieu (q.v.), was born at Rösult and educated at the grammar school and gymnasium of Wexiö. His taste for botany speedily showed itself, and was encouraged at the university of Lund. He moved to Upsala (1758), and undertook the management of the botanic garden and became the assistant of Rudbeck. He next went to and studied in Lapland, the result being his *Flora Lapponica*, (1735). He took his M.D. degree at the university of Harderwyk, in Holland, in 1735, and then proceeded to Leyden. After visiting England (1736) and Paris (1738), he settled at Stockholm as a physician. In 1741 he became Professor of Medicine, and then of Botany and Natural History. He was made Knight of the Polar Star, with the rank of nobility. His principal works were *Systema Naturæ* and *Fundamenta Botanica* (1735), *Genera Plantarum* (1737), *Classes Plantarum* (1738), *Flora Suecica* (1745), *Fauna Suecica* (1746), *Philosophia Botanica* (1751), *Species Plantarum* (1753).

Linnet, the finch genus *Linotæ*, especially *L. cannatina*, a common British bird, which, as a species, is resident, though large flocks arrive in spring and leave in autumn. The length is about six inches, and the plumage brown. Red, grey, and brown linnets are names for the same bird in different dress. They prefer uncultivated lands, and feed chiefly on the seeds of flax and hemp, whence their name in many European languages. *L. flavirostris* is the Mountain Linnet, *L. linaria* the Mealy, and *L. canescens* the Mealy Redpoll. [GREENFINCH.]

Linseed, the seed of the flax (q.v.), one of the most valuable of oil seeds. About 16,000,000 bushels are imported annually, chiefly from the East Indies, the Russian seed being smaller. The seed is either brown, white, or red. When crushed the seeds yield about 38 per cent. of *linseed oil*, a valuable drying oil, much used in paints and varnishes and in

making oil-cloth and printing-ink. When cold-drawn it is more viscid than when hot drawn. The four chief commercial varieties are *raw*, *refined*, *artists'*, and *boiled*. The refuse *oil-cake* after the oil is expressed is a most valuable and fattening food for cattle. The mucilaginous testa of the seeds makes them useful for poultices, and as an emollient tea.

Lint, a term applied to a soft material made by scraping linen, designed for application to wounds.

Linton, SIR JAMES DRUMGOLE (b. 1840), born in London, soon showed talent for drawing, and studied at the Newnham Street School of Art, conducted by Leigh. At the age of 21 he exhibited water-colours at the Dudley Gallery and the Institute of Water-Colour Painters. In 1863 he, with others, opened the Institute of Painters in Water-Colours, to which the Queen gave the title of Royal and conferred the honour of knighthood on its president (1885). In this year also he painted *The Marriage of H.R.H. the Duke of Albany* by Queen Victoria's command. Among his best pictures are the following: *Maundy Thursday, 1793*, *Love the Conqueror*, and *The Cardinal Minister*. His most successful pictures are those of single figures. He resigned the Presidency of the Water-Colour Institute in 1898.

Linz, a well-built town, the capital of Upper Austria, stands on the Danube at the influx of the Traun. Its principal manufactures are woollen cloth, tobacco, linen, leather, and machinery. Its public buildings include a national museum, a library of 33,000 books, a bishop's seminary, and a commercial school. A fine bridge crosses the Danube, and there are extensive ship-building yards.

Lion (*Felis leo*), the king of beasts, probably the largest of the Cat family, though some authorities maintain that in size it is equalled, if not surpassed, by the tiger. According to Flower and Lydekker (*Mammals Living and Extinct*) the largest tigers appear to exceed the largest lions. Selous gives 10 feet as the extreme measurement of a full-sized South African lion (the tail counting for nearly a third), and his mate may be put at a foot less. Lions constitute a single species, but they are subject to great variation in size and colour, the latter ranging from a deep chestnut-brown to light silvery-grey, and from these arose the stories of a white race of African lions. The male carries a large mane, of darker hue than the body fur, and ranging from pale fulvous to black, has tufts of hair on the elbows, and generally a fringe of hair along the middle line of the belly. It was formerly said that the Asiatic lions had no mane; but some which have lived in confinement have been as fully maned as specimens from Africa. Lions have been known to man since the earliest historic times. They are often mentioned in the Bible and by classic writers. Herodotus records their presence, in his day, in south-eastern Europe, and they were probably not exterminated on the Continent till about 2,000 years ago. Now they range through Africa from north to south, and are found in decreasing numbers in

Mesopotamia, Persia, and in the north-west of India. Lions generally frequent sandy plains and broken ground, where there is shelter of bush and thickets—and are rarely found in forests. They are mostly nocturnal in habit, and lie in ambush for their prey—chiefly antelopes, buffaloes, zebras, giraffes, sometimes young elephants and rhinoceroses, and, near civilised districts, horses, cattle, and sheep. They rarely attack man, except when surprised or wounded, but then they are formidable enemies, and old lions, when too feeble to overcome their accustomed prey, become “man-eaters.” The lion has a single mate, who brings forth from two to four at a birth, and the male assists in providing the young with food and in teaching them to kill. Lions breed pretty freely in captivity—the authorities at the Zoological Gardens, Dublin, being very successful in raising cubs which are marked with spots and stripes, which gradually fade as they reach maturity, and hybrids with the tiger, called lion-tigers, have been obtained. [CAVE-LION.]

Lipari Islands, the name of a group of volcanic islands situated about 24 miles N. of Sicily. They are named after Lipari, the largest, and include also Stromboli, Vulcano, and others. They produce corn and fruit, as well as alum, sulphur, and nitre. The celebrated crater of Vulcano was visited by General Cockburn (1812).

Liparite, RHYOLITE, or QUARTZ-TRACHYTE, a comparatively modern acidic lava, varying considerably in texture, colour, and composition, but having a generally glassy ground-mass containing crystals of sanidine and quartz with various accessory minerals, and named from its extensive occurrence in the Lipari Islands. It contains about 76 per cent. of silica, 13 of alumina, 5 of soda, 4 of potash, and more than $1\frac{1}{2}$ of iron-oxide; and its specific gravity is 2.5 to 2.6. It occurs extensively in Hungary, Iceland, and the western United States. Its glassy condition is obsidian (q.v.).

Lippe, an old North-German principality, bounded by Hanover, Hesse Cassel and Rhenish Prussia, is noted for its saline springs. The principal towns are Detmold, Lemgo, and Bückeburg. It has one vote in the German Reichstag, and one vote in the Federal Council.

Lippi, the name of a family of Florentine artists. The eldest, FRANCESCO FILIPPO (1421–88), took the vows of a Carmelite monk, but abandoned the Church. After many adventures he settled in Italy, and took service under the Grand Duke of Florence. FILIPPO (1460–1505), son of Francesco, enjoyed considerable reputation. LORENZO (1606–64), besides inheriting his ancestors' skill in painting, was a distinguished poet and musician, and wrote a burlesque poem, entitled *Malmantile Racquistato*.

Liquation, a metallurgical process in which a metal is separated from a mixture by so regulating the heat in a *liquation furnace* that one of the metals, if necessary alloyed with another metal added for the purpose, melts and is drawn off from the furnace, leaving the other still solid. Thus from an impure form of copper, obtained in the smelting

of the metal, and known as *black-copper*, the silver present is extracted by first adding a quantity of lead, and then subjecting to moderate heat, whereby the lead and silver form an alloy which melts, and is run off from the copper. The silver is afterwards separated by one of the numerous processes available, *e.g.* Pattinson's or Parke's.

Liquefaction is the process of change from the solid or gaseous into a liquid state. Heat has to be given to a solid to cause it to melt, but when a gas is liquefied heat is taken away from it. [LATENT HEAT.] Until comparatively few years ago it was supposed to be impossible to liquefy many gases, but the recent experiments with liquid oxygen show how much can be done under favourable conditions. It is not sufficient to have a low temperature in order to liquefy a gas; the change of state will not occur unless the pressure be sufficiently high. The effect of pressure on the liquefactions of a solid is not so marked, although it has some slight result. It was not until 1898 that a method of liquefying hydrogen gas was discovered, and in 1899 its solidification was also accomplished. Both of these feats were achieved by Professor Dewar. Highly-compressed air is allowed to escape through a very fine hole at the end of a coil, and, cooled by expansion, is made to return over the coil. With sufficient pressure, some of it liquefies and issues in drops at the end of the coil. This liquid air, when pure, is of a slightly bluish colour, and when poured into a glass vessel will boil, seeming to emit clouds of vapour. Many very interesting experiments can be performed with liquid air: alcohol can be frozen by contact with it; clouds of mist can be made without water, etc. etc. As a refrigerating medium, however, it is never likely to compete with ice.

Liqueurs are sweetened alcoholic liquors which have peculiar and characteristic flavours, owing to the presence of different aromatic compounds. Though giving the liqueur a decidedly pleasant taste, these compounds are, however, frequently of a deleterious nature.

Liquid is a substance that possesses no rigidity, and that offers great resistance to compression—*i.e.* it changes its shape under the action of a very small force, but not its bulk. The rapidity with which a small force can distort a liquid depends upon its *viscosity* (*q.v.*), there being much difference in this respect between a mobile liquid like water and a viscous liquid like glycerine. Many solid substances assume the liquid form under the application of sufficient heat, the actual transition being more or less abrupt and being accompanied with the apparent disappearance of heat. This is lost as heat, but appears as an increased kinetic energy of the particles of the substance as a liquid, which enables them to move past each other with a freedom impossible when the substance was solid.

Liquidambar, a genus of handsome trees forming the order Altingiaceæ, related to the planes and willows. They have scattered, petiolate, stipulate, deeply-lobed leaves; monœcious flowers

in separate catkins; a two-chambered ovary with many ovules; and broadly-winged seeds.

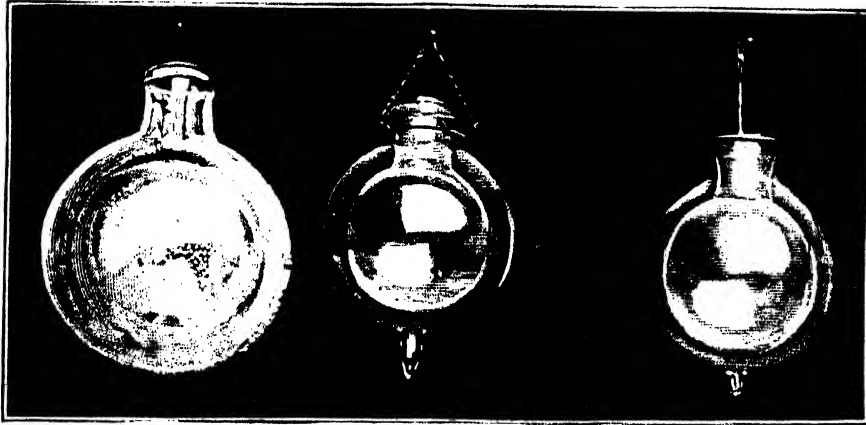
Liquidation. [BANKRUPTCY, COMPOSITION.]

Liquorice, an extract from the roots of the leguminous *Glycyrrhiza glabra*, *G. echinata*, and possibly other species. The first-named is an herbaceous perennial, 2 or 3 feet high, native of southern Europe, with pinnate leaves, bluish flowers, a tubular bi-labiate calyx, ovate straight standard-petal, straight pointed keel-petals, diadelphous stamens and an ovate, compressed 1 to 4-seeded pod. It has a tap-root sometimes 5 or 6 feet long. Turkey exports about 5,000 cases of 2½ cwt. each annually, and Spain produces about 3,000 tons. We also obtain large supplies from Italy and Russia, the produce of *G. echinata*, our total imports being from 1,500 to 1,700 tons a year. Liquorice is also cultivated in Surrey and Yorkshire, where it is used for making Pomfret cakes. The roots, which reach an inch in diameter, are sliced and boiled, the extract evaporated to dryness being known as *Spanish juice*. It is rolled into sticks which are black and glassy, 6 to 8 inches long, and wrapped in bay leaves. It owes its sweetness to 6 per cent. of *glycyrrhizin*, a sugar-like substance ($C_{16}H_{24}O_6$), in combination with ammonia. The favourite brands are those of Solazzi and Corigliano in Italy. It is much used as a demulcent for cough-lozenges, and is said to be also employed as an adulterant of porter.

Liquor Laws. [LICENSE, LICENSING LAWS.]

Lisbon, the capital and principal seaport of Portugal, is situated on the right bank of the Tagus, 9 miles from its mouth. The town boasts of fine buildings—including the palace of Ajuda, the castle of St. George, the cathedral, custom-house, church of St. Coração de Jesus—several of which are near the principal square, the Praça de Commercio. It also has scientific and literary institutions and a fine harbour, but the marvel of Lisbon is the marble aqueduct which brings the water more than ten miles across the valley of Alcantara. The exports are wine, oil, and fruit; the imports cotton, sugar, grain, coal, etc. The manufactures include tobacco, soap, wool, and chemicals. On November 1st, 1755, 30,000 inhabitants were destroyed by an earthquake, which wrecked the western half of the city and caused the fall of almost all the large public buildings and churches and convents.

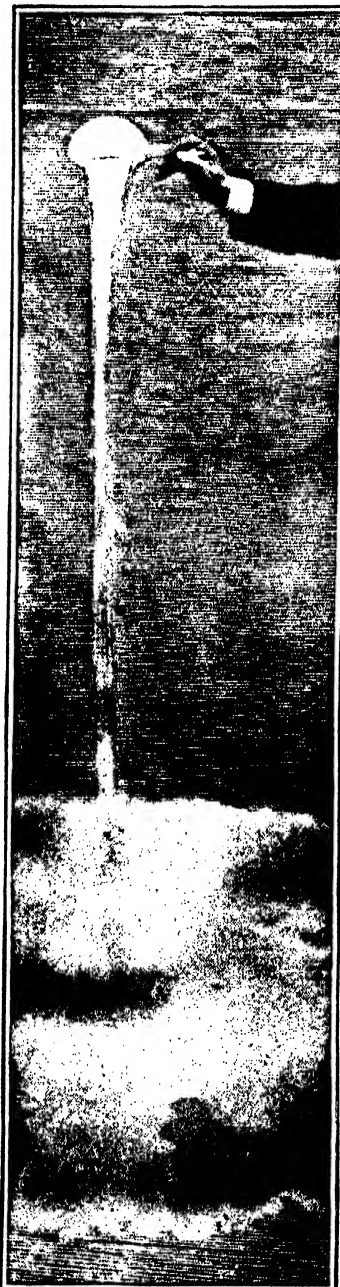
Lissajou's Figures. If rays of light are allowed to fall on a mirror fixed to one branch of a tuning fork they will be reflected, and we can place a second mirror (similarly attached to another tuning fork) so that the rays reflected from the first fall upon the second, and are again reflected on to a screen. We can thus obtain a spot of light on the screen, and by letting either fork vibrate alone, the motion of its attached mirror will cause the spot to travel to and fro in a straight line on the screen. On account of the persistence of vision we then see a line of light. If the first fork can vibrate in a vertical plane and the second in a horizontal one, both being at right angles to the



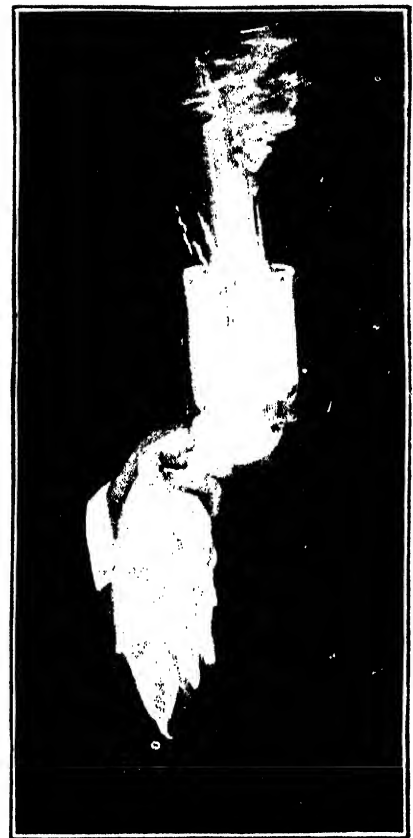
A single flask of liquid air instantly covered with frost, and double flasks with vacuum between, showing no sign of cold.



The Geyser.



Making clouds of mist without water.



Steel wire burning in an ice cup.



Dripping alcohol partly frozen.

screen, then the line of light will be either vertical or horizontal according as the first or second fork vibrates alone. If the forks vibrate together the spot of light describes a curve, and the curves so obtained are known as Lissajou's figures. They are of countless different shapes, being determined by the rates at which the forks vibrate. The experiment is an extremely beautiful one, and is also of practical importance, since it gives a means for comparing different tuning forks.

Lissu (LI-TZU), a large nation of the province of Yunnan, south-west China, chiefly in the upper valleys of the Salwen and Mekhong rivers within the Chinese frontier. Those in the vicinity of the large towns recognise the authorities and pay regular tribute; but those of the remote hilly districts are still independent, making periodical raids on the settled populations of the plains. Fair notice, however, is given of these expeditions by an envoy, bearer of a symbolic rod, the strange devices on which are by him interpreted to the Chinese officials. Although possessing no firearms, they generally get the better of the timid peasantry, whose women and children they carry into slavery, plundering and destroying their villages. These relations have been continued for many generations, because the local mandarins, having formerly reported the utter extermination of the Lissu wild tribes, their successors are obliged to keep up the fiction for fear of incurring the wrath of the Imperial Government. Hence the Lissu are officially extinct, but in reality one of the most active and energetic peoples in China. Their weapons are a sabre six feet long, a huge round shield, and an arbalest which sends poisoned arrows farther than the bullets of any Chinese musket. Besides the paramount chief, usually a member of the kindred Mossu nation, there are numerous petty chiefs who regulate all communal affairs. All are still pagans (Shamanists) and polygamists, and much addicted to drink. They depend partly on hunting, partly on agriculture, and trade with the surrounding tribes, using a gold currency obtained from the auriferous sands of the Upper Salwen. (Desgodins, *Les Sauvages Lyssou*, in *Bul. de la Soc. de Géo.*, July, 1875.)

Lister, LORD (b. 1827), a distinguished surgeon, whose studies on inflammation have produced the now universally used antiseptic treatment of wounds, etc., and the antiseptic method of operation, graduated at London University in arts (1847) and in medicine (1852). In the same year he became a fellow of the Royal College of Surgeons. He was then successively appointed assistant-surgeon and lecturer in Edinburgh, Regius Professor of Surgery in Glasgow, Professor of Clinical Surgery in Edinburgh, Professor of Clinical Surgery in King's College Hospital, London (1877), and eventually Surgeon Extraordinary to Queen Victoria. Lord Lister holds many foreign orders, and has received the medal of the Royal Society (1880) and the prize of the Academy of Paris (1881). He holds several honorary degrees, in 1883 was made a baronet, and in 1897 a peer.

Liszt, ABBÉ FRANZ (1811-86), a Hungarian pianist and composer, first appeared in public in his ninth year. He studied in Vienna and Paris, and produced an opera. In 1861 he took orders in Rome, and later in 1870 became director of the conservatory of music at Pesth. His compositions include the oratorios *St. Elizabeth* and *Christus*, and the *Faust* and *Dante* symphonies besides some very characteristic *Hungarian Rhapsodies*.

Litany (Greek, "supplication") originally denoted any form of prayer, but the name was afterwards confined to that used in times of special distress, when the people marched in procession through the streets, exclaiming repeatedly, "Lord, have mercy upon us! Christ, have mercy upon us!" The litany, as its name implies, was of Eastern origin. Towards the end of the 5th century it was adopted in Gaul, and from Gaul the litany passed to Rome at the close of the 6th century in the pontificate of Gregory the Great, who divided the citizens into seven classes, appointing a separate procession and litany for each class. This service is called the "Great Litany of St. Mark," because it was held on St. Mark's Day. In course of time numerous invocations to the Virgin, apostles, martyrs, and saints were introduced. When the litany was translated into English, during the Reformation, these were gradually eliminated, and the service assumed very much the same form that it has now. In the Church of Rome it is used on the Rogation Days, St. Mark's Day, and various other occasions. Its use on Sundays is peculiar to the Church of England.

Litchi, the fruit of *Nephelium Litchi*, a sap-indaceous tree, native to southern China. It is nearly round, $1\frac{1}{2}$ inches in diameter, reddish-brown, and warty, so as sometimes to be sold as Chinese strawberries. A white gelatinous pulp shrivels and blackens in drying, but remains sweet. Large quantities are eaten in China, and the demand for them is on the increase in England.

Litharge consists of the monoxide of lead, PbO, and is formed by heating lead in air. It has a yellow colour, and if melted and slowly cooled forms a fine crystalline mass. By more careful cooling crystals of the form of rhombic octahedra may be obtained. It also occurs native in some Mexican localities. It is largely employed in the manufacture of flint glass, as a glaze for earthenware, in the production of red-lead, white-lead, and of most of the lead compounds or preparations.

Lithic Acid is another name for uric acid. The condition in which there is an abnormal quantity of lithic acid in the blood, such as occurs in gouty subjects, is termed the *lithic acid diathesis*.

Lithium is a metallic element discovered in the mineral *petalite* at the beginning of the present century. The metal itself, however, was not isolated until 1855. It occurs in a few minerals such as *petalite*, *spodumene*, *triphyline*, but in small quantities it is present in most mineral and spring waters,

and occurs also in the ash of very many plants, *e.g.* vine, seaweeds, coffee, tobacco, etc. In its chemical deportment it closely resembles the alkali metals sodium and potassium, forming an alkaline hydroxide, LiHO . It differs from these, however, in forming an almost insoluble carbonate. It is a silver-white metal soft enough to mark paper. It may be drawn out into wire, and tarnishes if exposed to the air. It melts at 180° , and burns with a bright white light. It has the lowest atomic weight (7.1) of all the elements with the exception of hydrogen, and is remarkable as being the lightest solid known, possessing the specific gravity of .59. Even when present in very minute quantities it may be detected by means of a spectroscope, its spectrum showing two very characteristic lines, one in the yellow, the other in the red.

Lithofracteur is a sort of dynamite consisting of not more than 55 parts of nitro-glycerine mixed with 45 parts of a pulverised compound of one part of charcoal, bran, and sawdust, singly or in combination, $3\frac{1}{2}$ parts of kieselguhr, $2\frac{1}{2}$ parts of nitrate of baryta and bicarbonate of soda, or either of them, and $\frac{1}{2}$ part of sulphur and manganese, or either of them.

Lithography, the art of producing pictures or writing on stone in such a way that impressions may be taken from it in ink by a method similar to that employed in ordinary printing. Lithography was invented at Munich by Aloys Senefelder in 1796. The physical facts which render it possible are the adhesive character of greasy matter when brought into contact with calcareous stone, the mutual affinity of greasy substances and their antipathy to water, and the readiness with which water is absorbed by calcareous stone. The best stone for the purpose is composed of clay, lime, and siliceous earth, which is quarried at Solenhofen, in Bavaria. A clear grey colour is preferable to any other. The most important processes by which the design is produced are the following:—

(1) *By direct drawing.* The design may be executed either with a crayon or by applying ink with a pen or brush. The ingredients used in the preparation of the inks are lard, hard soap, shell-lac, white wax, carbonate of soda, Venetian turpentine, and Paris black. Chalk-drawing is the most artistic kind of lithography, but it is now almost entirely superseded by more convenient processes. The first step is to grind the stone with a little fine gravel sand and water, and to pumice it. A chalk drawing is first traced in outline with the crayon, and then tinted or shaded. When the drawing is complete, the stone is etched, the same means being employed in both processes. It consists in the application of a weak solution of nitric acid in gum-water, which removes the grease-oils from the stone, brings out the lines of the drawing, and lays bare the pores in the unmarked portions, so that they may more easily imbibe a solution of gum-arabic in water with which the stone is now flooded. When this has been removed, the printer “washes out” the picture

with turpentine, leaving only a faint white impression, but, though the ink has disappeared, the grease remains in the stone. A damp towel is now applied to the stone, and the inking-roller is passed over it, the greasy lines absorbing the ink, whilst the wetted and gummed surface remains free from it. An impression of the design is then taken on a piece of paper, which is passed through the printing-press.

(2) *Transfer from paper, or from another stone.* The design is executed in lithographic transfer ink on paper which has received a coating of isinglass, flake-white, and gamboge. The paper is then damped and pulled through a press with the coated side towards a heated stone. After this the paper is removed, whilst the ink remains adhering to the stone. The subsequent treatment is identical with that in the preceding process. Chalk drawings also are now usually executed in this manner, the design having been first of all drawn with lithographic chalks on paper to which a grain has been given by mechanical means.

(3) *Engraving on stone.* A thin coating of gum is placed on the surface of a polished stone, and coloured by rubbing in Paris black or some other pigment. The design is then cut through the gum on the stone by means of steel needles fixed in cane handles. The stone is next covered with oil or some other greasy matter, which passes into the incisions formed by the needles. The stone is afterwards treated in the same manner as in the processes already described, except that in place of a roller, an instrument called a “dabber” or “dauber” is used to rub the ink into the lines.

(4) *Chromo-lithography.* By this process coloured pictures are produced, a separate stone being used for each colour and tint required. Usually the whole outline is first drawn on, or transferred to a stone called the keystone, and from this again it is transferred to as many other stones as may be required, thus enabling the artist to determine the outline of each of the colours, and prevent them overlapping. The unnecessary lines can be easily removed in each case by the use of water. In one of the impressions taken from the key-stone the entire outline is retained, it is given a neutral grey tint, and is made the basis of the intended picture. There are various methods of “registering,” *i.e.* securing the exact correspondence of the outline on each of the stones.

(5) *Photo-lithography.* By this process it is possible to obtain copies of drawings executed in clear lines or dots. The drawing is photographed on glass, specially-constructed lenses being employed. The negative is inserted in a photographic printing-frame, and an impression is taken from it on a piece of sensitive transfer-paper, and thence transferred to a stone, after which the printing is effected in the manner already described.

Lithotomy, the operation of opening the bladder with a view to the removal of a stone.

Lithotrite, an explosive of Belgian origin, in form of fine grey powder, which is sometimes compressed into cartridges. It contains nitrate of

soda, saltpetre, sawdust, charcoal, picrate of ammonia, ferrocyanide of potassium, and sulphur.

Lithotrity, the operation of crushing a stone by means of a suitable instrument introduced into the bladder, and then washing out the fragments. Lithotrity has to a considerable extent superseded the far more ancient operation of lithotomy in the surgical treatment of stone in the bladder.

Lithuania, a region in the E. of Europe, which was a grand-duchy in the 11th century. In the 14th century it was united to Poland, and now belongs to Russia, comprising the governments of Mohilev, Vitepsk, Minsk, Vilna, and Grodno.

Lithuanians, an Aryan people, whose domain formerly comprised most of the Baltic provinces and extensive tracts in East Prussia and about the frontiers of Poland and Russia, but is now mainly restricted to the region enclosed by the Lower Dwina and Niemen rivers. They are interesting, especially to philologists, on account of the extremely archaic type of their Aryan speech, which is most akin to the Slav branch, but preserves many grammatical forms older than Greek or Latin and, in some instances, even than Sanskrit. Since the 10th century they have been divided into three distinct groups:—the *Bourssians* (Prussians), Germanised in the 17th century; the *Lettons* (Letts), of Courland and parts of Livonia, Esthonia, and Vitebsk, some of whom are also Germanised and others Russified; the *Lithuanians*, including the *Yonuds* (Samoyitians), of the lowlands, and the Lithuanians proper (*Litva*) of the uplands. Total population of Lithuanian speech over 3,200,000. Of the two surviving languages, Lithuanian proper is by far the more ancient, bearing somewhat the same relation to Lett that Latin does to Italian. Its preservation for thousands of years between the Slav and Teutonic domains enclosing it on the west, south, and east, is all the more inexplicable that it has never been cultivated as a literary language, and reduced to written form only in quite recent times. The culture received from the Germans and Poles never penetrated beyond the highest circles; and when the Lithuanians overran several Russian provinces in the 12th and 13th centuries, they adopted the Slav alphabet and composed all their chronicles in Russian. Even now nothing is printed in this ancient Aryan tongue except religious tracts and a single newspaper published in Prussia. After the annexation of Lithuania to Poland, on the extinction of the Jagellon dynasty (1572), most of the people became, and still remain, Roman Catholics; while others under analogous political influences became Lutherans or Orthodox Greeks; but all preserve reminiscences of pagan times, and the names of the old gods are still familiar to all classes. In other respects the Lithuanians are an extremely slow and stolid people; an unenterprising, almost spiritless, peasantry, formerly serfs, now little better than farm labourers; yet possessed of some intelligence, as shown by their rich unwritten literature, which abounds in national songs, idyllic and lyric poetry inspired by much tender sentiment

and love of nature. Since the 14th century Wilna (founded 1320) has been the chief centre of Lithuanian culture, such as it is. (Koeppen, *Der Litanische Volkstamm*, 1855.)

Litmus, a blue colouring-matter prepared in Holland from the archil-producing lichens *Roccella* and *Lecanora*, with carbonate and sulphate of lime, as small blue cakes. It is almost exclusively used as a chemical test—a neutral aqueous solution staining bibulous paper violet, the least trace of free acid changing it to red, and free alkali changing it to blue.

Litre is a measure of volume in the metric system (q.v.). It is the volume of a cubic decimetre, and contains 1,000 cubic centimetres.

Littleton, or LYTTLETON, THOMAS (d. 1481), a most distinguished English judge, who was born at Frankley early in the fifteenth century. In 1455 he traversed the northern circuit as judge of assize, and in 1466 was one of the judges of Common Pleas. He was created a Knight of the Bath in 1475. His Anglo-French treatise on tenures is considered even now as the principal authority on real property in England. [COKE.]

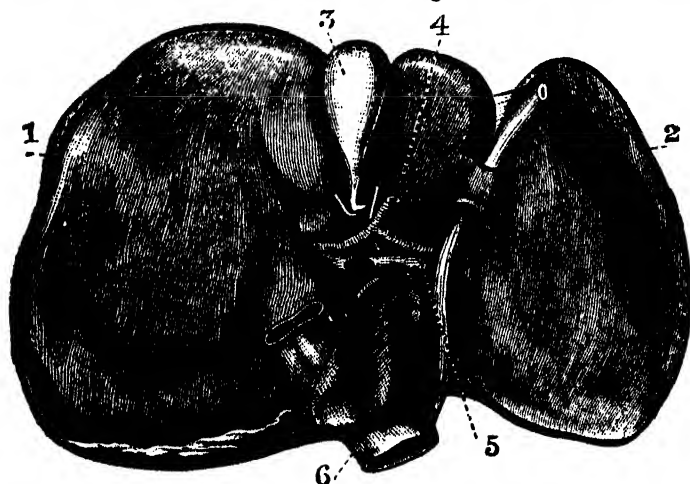
Littre, MAXIMILIEN PAUL EMILE (1801–81), a French lexicographer and philologist, was born at Paris. He was connected with the *National* and other journals, wrote a summary of Comte's philosophy and part of a *Literary History of France*. He was elected to the Academy in 1871, the date of the last volume of his magnificent *Dictionnaire de la Langue Française*, in which the plan of tracing the history of each word was first systematically and extensively carried out.

Liturgy, in strict ecclesiastical phraseology, denotes only the office used in the celebration of the Eucharist; but it is now used in a wider sense, so as to include every form of prayer, praise, and thanksgiving prescribed for use in public worship. In the ancient Athenian polity the richer citizens were required to defray the cost of maintaining the public games and other expenses of a similar kind. The classical term *leitourgia* used to denote these special services afterwards acquired a more general meaning, and was adopted in the Septuagint to express the worship which took place in the Temple. When the word came into use among Christians, its meaning was at first narrowed as explained above. Consequently, there are two kinds of liturgies, which require to be discussed separately. (1) It is probable that from the first there was some form of liturgy over and above the simple ritual ordained by Christ, and the different liturgies which subsequently arose were all developments of one original type. They fall into five groups—viz. three Eastern, the West Syrian, the East Syrian, and the Alexandrian; and two Western, the Hispano-Gallic and the Roman. A liturgy belonging to the Hispano-Gallic group was probably in use in the south of Britain before the arrival of Augustine, whilst in the Irish Church both the Gallican and the Roman rites were followed. The Roman liturgy can be traced back to the days of Innocent I., but did not assume its

final form till the period of Gregory the Great, under whom it was introduced into England by Augustine. The most ancient and solemn part of the liturgy is the "anaphora" or "canon," which began with the *Sursum Corda* and comprised the rest of the service, including the consecration of the elements; the preceding portion was termed the pro-anaphoral. The canon was identical in the "uses" of Sarum, York, Lincoln, and the various other English missals. The present Communion Service of the Church of England is based mainly on the Sarum Use, with some modifications. (2) The various services of the Roman Church, exclusive of those in the Missal, are contained in the Breviary (q.v.), the Manual (q.v.), and the Pontifical (q.v.). At the time of the Reformation some liturgy or fixed form of public prayer was adopted by each of the Lutheran and Calvinist Churches. On the Continent, however, more opening was usually left for free prayer than was the case in England, where the Book of Common Prayer was rigidly enforced on all congregations. [PRAYER-BOOK.] The severity of the Anglican system was extremely distasteful to the Puritans, and fostered amongst them a dislike to set forms of worship which has always prevailed in Nonconformist bodies.

Liutprand, LUITPRAND, LIUDPRAND (922-72), an Italian historian and prelate, was born in Pavia. In 931 he became page to Hugo, King of Lombardy, and then Chancellor to Berengarius II., Hugo's successor. Falling into disgrace, however, he took service under Otto of Germany (who became King of Lombardy, 951), and was made Bishop of Cremona. He was frequently employed as an ambassador. His works include a *History of Otto*, and *Antipodosis*, a history of Europe in six books from 886 to 950.

Liver. The liver lies in the upper part of the cavity of the abdomen immediately beneath the diaphragm. Its large lobe is situated in relation with the lower ribs on the right side, while the



THE LIVER : ITS INFERIOR SURFACE (TURNED UPWARDS).
1 Right lobe ; 2 left lobe ; 3 gall-bladder ; 4 hepatic artery ;
5 portal vein ; 6 vena cava.

smaller left lobe extends beyond the middle line of the body into the left hypochondriac region. The liver is the largest gland in the body, and weighs about 50 ounces in the adult. In addition to the

right and left lobes already alluded to, and lying between them, are three smaller lobes known as the *lobulus caudatus*, the *lobulus quadratus* and the *lobulus Spigelii*. The liver is held in its place by ligaments, and at the transverse fissure on its under surface there are situated the *hepatic artery* (which conveys fresh arterial blood to the liver), the *portal vein* (which transmits the blood charged with substances absorbed from the digestive tract), and the *hepatic duct* (which conveys the bile secreted by the liver and destined to be passed into the intestine and to aid in the processes of digestion). The branches of the three vessels just alluded to course together through the substance of the liver, being surrounded by an investment of connective tissue. The liver substance is divided into innumerable lobules, and the arrangement of the branches of the portal vein in respect to these lobules is peculiar. The smaller ramifications into which the portal vein subdivides run between the several lobules, and are hence spoken of as *interlobular veins*. These interlobular veins give off a network of capillaries converging from all sides of the lobule towards its centre, where the blood is collected into what is known as an *intra-lobular vein*. The intralobular veins unite with one another to form what are called *sub-lobular veins*, and these discharge themselves into the hepatic veins, which finally convey the blood into the vena cava inferior, and so to the heart. The branches of the hepatic artery distribute blood to the connective tissue framework of the liver, and to the ducts and blood-vessels and other parts of the gland, and the fluid conveyed by them ultimately finds its way into the hepatic veins. The liver contains a mass of cells, many-sided epithelial cells (polyhedral cells), which enter into the composition of the several lobules, and between which the capillary network already alluded to is disposed. It is the function of these cells to secrete certain materials from the blood contained in the neighbouring capillaries, and among other things to elaborate from the materials so secreted the bile, which is then transmitted to the ultimate branches of the hepatic duct, collected together by the system of ramifications of that duct, and conveyed either for storage in the gall bladder, or directly through the common bile duct into the duodenum. [For the composition of the bile and its action in aiding digestion see BILE.] In addition to its bile-forming function, the liver plays an important part in modifying the composition of the blood which passes through it on its way to the hepatic veins ; and in particular the liver cells elaborate from the blood and store up for future use in the animal economy a substance known as *glycogen*. This glycogenic function of the liver was discovered by Claude Bernard, who showed that some of the food stuffs, absorbed from the digestive tract and conveyed by the portal vein to the liver in a soluble form, were abstracted from the portal blood by the activity of the liver cells, and stored up in them in the form of a substance known as *animal starch* or *glycogen*. This glycogen is subsequently again transmitted to the blood in the form of a soluble sugar in accordance with the needs of the body.

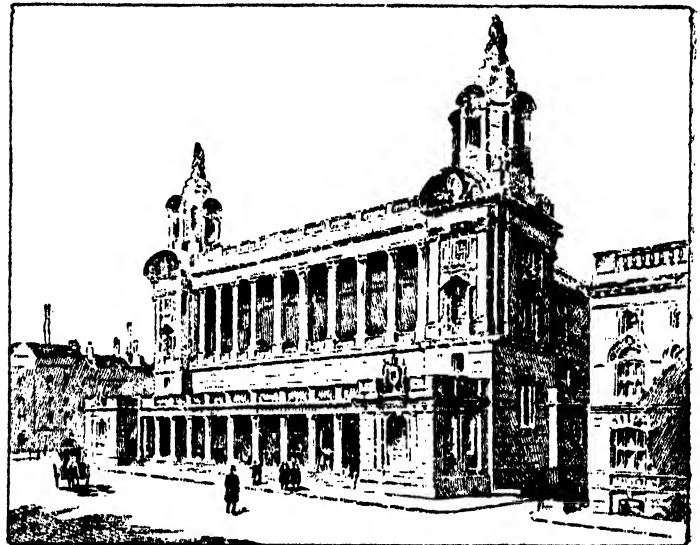
Diseases of the Liver. The liver is commonly credited with being the cause of innumerable disorders, and the complexity of the changes which occur in the gland is such as to render any disturbance in the normal conduct of the operations of the liver of extreme importance. [BILIOUSNESS, JAUNDICE, CALCULUS, CIRRHOSIS.] Abscess of the liver is sometimes met with in those who have lived in tropical climates, and it appears to be in some way associated with dysentery. Certain degenerations of the substance of the liver are described; the *amyloid* or *lardaceous* degeneration is one of these; fatty degeneration also occurs, and often in association with consumption. The liver undergoes a peculiar change as the result of interference with the circulation in certain forms of heart disease, what is known as the "nutmeg liver" being produced. New growth is not uncommon in the liver, but is usually secondary to the appearance of cancerous formation elsewhere. Hydatid cysts (q.v.) are sometimes met with in the liver.

Liver-flukes (*Distomidae*), a group of parasitic worms, the best known of which causes "rot" in sheep. The life-history is very complex, as the animal passes different periods of its life in different hosts. The adult form inhabits the bile ducts of various domestic animals, most commonly the sheep. The eggs produced by the adults pass out of the body of the host, and when they happen to get into a pool of fresh water give rise to a small free-swimming embryo, which makes its way into the body of a pond-snail (*Lymnæus*). There the embryo becomes a sac-like body (sporocyst), which gives rise within itself to numerous Rediæ, a form differing much from the adult. These Rediæ may produce other generations like themselves, or may give rise to the next stage, the Cercaria. This is more like the adult, as it already possesses suckers, but differs from it in the presence of a powerful swimming tail, by means of which, having now bored its way out of the snail, it moves rapidly about in the water. After a time it creeps up a blade of grass and forms a kind of little cocoon; this being eaten by a sheep, the covering is digested, and the freed larva bores its way into the animal's liver and there becomes sexually mature.

Liver of Sulphur, a mixture of sulpho-compounds of potassium, chiefly sulphides, formed by heating together potassium carbonate and sulphur in a closed crucible. The resulting mass is of a liver colour, and was known to the alchemists and used by them as a medicinal preparation. It is still employed as such, being known in the Pharmacopœia as potassa sulphurata.

Liverpool, the second seaport in the kingdom, an episcopal city (since 1880), and a parliamentary and municipal borough. The city, which covers an area of 26 square miles, has nine parliamentary divisions, viz.: Abercromby, Everton, Exchange, Kirkdale, Scotland, Toxteth East, Toxteth West, Walton, and West Derby, each division returning one member. Liverpool stands on the river Mersey, four miles from the sea and 185 miles N.W. of London. The architecture of the town

has been greatly improved since the middle of the 19th century, and it now possesses many fine thoroughfares. It has some magnificent public buildings, among which are the town-hall, the municipal offices (built at a cost of £160,000), the cotton exchange (opened in 1906), the revenue building, the St. George's Hall, the exchange, the public library and museum, built by Sir William Brown at a cost of £30,000, an art gallery (costing the same) given by the late Sir A. B. Walker, the Picton reading-room, the Government offices, and the law courts. In the course of erection is a large and handsome cathedral, the foundation stone of which was laid by Edward VII. Liverpool is well off as regards education, as it contains a University



LIVERPOOL COTTON EXCHANGE.

(founded in 1903) with a large teaching staff, the Royal Institute, School of Art and Gallery of Art, and numerous excellent schools. There are many beautiful parks (Sefton Park, the largest, covers 400 acres) and open spaces under the control of the Corporation. Nor has Liverpool forgotten, in spite of the spirit of cosmopolitanism which necessarily exists, to care for the poor, the sick, and the afflicted, and there are numerous institutions which reflect the generous spirit of charity which permeates the great body of its citizens. The water supply is derived from two sources, from Bolton and Blackburn, and also from Vyrnwy in Wales. Liverpool possesses extensive docks, and an enormous landing-stage which rises and falls with the tide. Most of the docks have been built within the last hundred years, and are amongst the greatest engineering triumphs of the 19th century. They stretch along the river for a distance of nearly seven miles, and are surrounded by immense warehouses, all belonging to firms engaged in the foreign or the colonial trade. The total tonnage of the seaport, entered and cleared, is upwards of 14,000,000. The exports amount to nearly £300,000,000 annually; the imports (which include coffee, cotton, grain, timber, wool, and cattle) amount to a still larger amount. The steamer traffic, which links Liverpool with every port of importance in the world, brings large

numbers of emigrant and other passengers to the town, which has a splendid electric tramway service, with about one hundred miles of rails. In 1886 a tunnel beneath the Mersey connected Liverpool with Birkenhead. Liverpool has large shipbuilding yards, while its iron and brass foundries, and its manufactures generally are, taking them as a whole, such as no other provincial city in England can boast. There is a tradition that St. Patrick sailed from this port for Ireland, but the first historic allusion to Liverpool is found in the charter granted to its burgesses by King John in the year 1207. Pop. (1901), 684,947.

Liverpool, ROBERT BANKS JENKINSON, EARL OF (1770-1828), entered Parliament under Pitt in 1790, and in 1796, on his father receiving a peerage, became Lord Hawkesbury. As Foreign Secretary he negotiated the Treaty of Amiens, and became Home Secretary in 1804. He was Premier (1812-27), but his prosecution of Queen Caroline made him extremely unpopular.

Liverworts, or HEPATICÆ, so-called from the form of the thalloid stems of some of the commoner genera (*see* Figs. on p. 151 in vol. ii.), form the lower class of the sub-kingdom Bryophyta (q.v.). Their vegetative structure is either *frondose* or *thalloid* (as in *Marchantia*), or *foliose* (as in *Jungermannia*). The thallus may be homogeneous, but is generally distinctly dorsiventral, the upper surface bearing curious stomata (q.v.), and the lower surface having root hairs and minute leaf-scales. The foliose forms are also dorsiventral, as though the stem is cylindric and ascending. It bears its leaves in two dorsiventral rows, sometimes with a third under row known as *amphigastria*, and it is the lower surface which roots. The leaves are but one cell thick, and have no veins. Most species can reproduce themselves by asexual gemmæ, which are sometimes borne on the thallus in cup-like receptacles. Liverworts have also a sexual reproductive system. The antheridia are variously situated, but are always spheroidal, stalked, and enclosed by one layer of cells. They emit crowds of mother-cells of the antherozoids, and these last are clavate, spiral and bi-ciliate. The archegonia are surrounded by modified terminal leaves (the *involucre*) and by a tubular "perianth." They burst near their apex to form the *calyptra*, and the *capsule* (*sporophore*), which has originated from the fertilised germ-cell, generally divides into four valves. It bursts in many cases owing to the hygroscopic action of elongated cells with a double spiral filament in them which are known as *elaters* and are mixed with the spores. There is no character of universal application to separate them from mosses (q.v.). Liverworts occur in moist situations all the world over, but have no economic applications.

Livingstone, DAVID (1813-73), famous missionary and African traveller, was born at Blantyre, Lanarkshire, and worked there in a mill till, having learnt Latin and attended Greek and medical classes, he became a licentiate of the Faculty of Physicians and Surgeons of Glasgow. In 1840, under the auspices of the London Missionary

Society, he went to South Africa, and there joined Robert Moffat, his future father-in-law. His first post was in the Bechuana territory. He then travelled and discovered the valley of Zouga and Lake Ngami, visiting Linyanti and the river Zambesi. Then followed various minor explorations till 1865, when he started to try and find the source of the Nile, discovering Lakes Bangweolo and Moero and the Upper Congo. For three years no news came, and then it was told that H. M. Stanley had met and helped him at Ujiji on Lake Tanganyika. He died at Bangweolo on May 1, and was carried to the coast, preserved in salt, by his followers. He is buried in Westminster Abbey.

Livonia, or RIGA, a Russian government, with an area of 17,609 square miles, including the island of Oesel in the Baltic. It yields large supplies of timber and oats.

Livonians, the primitive inhabitants of Courland and of Livonia, to which they give their name. Their language and usages show that they are closely related to their eastern neighbours, the Esthonians, who are of Finnish stock and speech. Nearly all, however, are now absorbed in the surrounding German and Lithuanian populations, and at present the Livonian language is spoken only by about 2,400 persons occupying a few hamlets at the north-west extremity of Courland. In Livonia it appears to have died out about the middle of the present century.

Livy (B.C. 59-A.D. 17), the English form of TITUS LIVIUS, a celebrated Latin historian, born at Patavium (Padua), where he died after spending most of his life in Rome at the court of Augustus, his patron and friend. Out of the 142 books of his *Annales*, or *History of Rome*, only 35 remain. His style, despite a certain provincialism or "Patavinitas," detected in it by ancient critics, is now regarded as faultless, but he is often inaccurate.

Lixiviation is the term applied to the process whereby soluble matter is extracted from a mixture with insoluble material by water or other liquid. On the large scale many mechanical devices are employed in order to complete the separation with the use of as little water as possible.

Lizards (*Lacertilia*), an order of reptiles very widely distributed between lat. 60° N. (above which they are rarely met with) and the south of Patagonia, but most abundant, and in the highest development, between the tropics. The body is more or less elongated, and generally terminates in a tapering tail; the skin may be covered with scales, scutes, granules, tubercles, or spines. Four limbs are generally present, but either pair may be absent, or both may be reduced to rudiments and hidden beneath the skin. The cloacal aperture is transverse, and the male organ double. The teeth are attached to the jaw, and may be fused to the inner side (*pleurodont*), or set on the edge (*acrodont*). Most of them are oviparous; but in a few the eggs are hatched within the body of the parent, as in the Viviparous Lizard and the Blindworm (q.v.). There are about 20 families, with some

1,600 species. They vary in size from 6 feet to a few inches, and differ as widely in habit. Most are terrestrial, some are arboreal, and a few burrow. The majority feed on small vertebrates and insects, but some are vegetable feeders. There are four British lizards, *Lacerta vivipara*, *L. agilis*, and *L. viridis* (from the Channel Islands), with four limbs, each with five digits, and the limbless Blindworm (q.v.). [AGAMIDÆ, AMPHISBÆNA, CHAMÆLEON, GECKO, HELODERM, IGUANA, MONITOR, SKINK.]

Llama (*Auchenia glama*), the American camel, probably descended from the guanaco (q.v.) and, like its namesake, known only in domestication. It stands about three feet high at the shoulders, and has coarse woolly hair, black, white, or a mixture of both.

Llandovery Beds, a series of sandstones, conglomerates, and shales, well exposed in the neighbourhood of Llandovery, Carmarthenshire (whence they take their name), and covering a great part of South Wales and of the shores of Cardigan Bay. The prevalence of the brachiopod genus *Pentamerus* throughout the series has caused them to be sometimes termed the *Pentamerus* beds.

Llandudno, a watering place in Carnarvonshire, Wales, standing under Great Orme's Head on the north side of the peninsula between Orme's Bay and the estuary of Conway. It has fine scenery, a pier, and good sea-bathing. Pop. (1901), 9,307.

Llorente, JUAN ANTONIO (1756-1823), a Spanish historian, educated at Tarragona, was ordained priest in 1779, became vicar-general of Calahorra (1781), and chief secretary to the Inquisition (1791). After the suppression of the Inquisition he published (1817) his *Critical History of the Inquisition in Spain*. On the return of Ferdinand he was exiled, and lived in England and in Paris, where he published (1822) his *Portraits Politiques des Papes*, which caused his exile from France.

Lloyd George, RIGHT HON. DAVID (b. 1863), was admitted a solicitor in 1884, and later practised in London. He became Member of Parliament for Carnarvon in 1890, and was one of the most effective platform speakers of the Liberals in opposition. In 1905 he was made President of the Board of Trade, and in 1907 he settled the Railway Dispute. Later he conciliated the masters and men in the Cotton industry. He is responsible for the Patents Act and a scheme to purchase the docks of London by the State. In 1908 he was made Chancellor of the Exchequer, and in 1907 submitted a much-discussed budget, which differed in many respects from its predecessors in that it aimed at producing an expanding revenue for future years in addition to meeting the requirements of the current year. This budget the House of Lords, in the December of that year, refused to pass before its approval by the country. In the election that took place in January, 1910, Mr. Lloyd George was returned to office, and the budget was passed in April of the same year.

"Lloyd's," an incorporated association of underwriters, or persons who, for consideration, guarantee the risk of loss of shipping and cargoes, etc. It takes its name from a coffee-house which, about 1688, was kept by Edward Lloyd in Tower Street, and was a notable resort of London merchants. Lloyd removed in 1691 to the corner of Abchurch Lane and Lombard Street, and soon made his house the headquarters of the shipping business. "Lloyd's" now occupies part of the first floor of the Royal Exchange, Cornhill, and the present association dates from 1771. It was incorporated by Act of Parliament in 1871. To assist its operations it has agents at all the large commercial ports in the world, and it supports a daily paper, *Lloyd's List*. A distinct but allied association also issues annually *Lloyd's Register*, which contains particulars, accumulated by Lloyd's agents and surveyors, of every ship in existence of upwards of 100 tons' measurement. It publishes, in addition, a *Yacht Register*. For insurance purposes, Lloyd's through a sub-committee classifies ships and assigns them a character which regulates the conditions of insurance. The soundness and seaworthiness of the vessel herself are indicated by a letter, the efficiency of her equipment by a number, and to the letter and number may be added the length of time for which the classification is expected to hold good. The letters used are A, A (red), Æ, and E. Numbers prefixed to letters are for purposes of comparison only, 100, for example, being better than 90.

Loach, any fish of the group Cobitidina of the Carp family (*Cyprinidæ*). There are six, or more, barbels; the dorsal fin is short or moderate, and the air-bladder partly or wholly enclosed in a bony capsule. The best known forms are *Misgurnus fossilis*, the Thunder-fish from stagnant waters of Germany and northern Asia; *Nemachilus barbatulus*, the common Loach of Britain and the Continent; and *Cobitis taenia*, the Groundling.

Load-line, the proper line of flotation for a ship proceeding to sea, or, more particularly, a line marking the extreme degree of immersion allowed to a vessel by the Board of Trade. This is indicated in British merchant vessels by the "Plimsoll Mark," a white circle traversed by a white horizontal bar, which is painted on every such ship's side.

Loam, an earthy rock composed of clay and sand neither of which amounts to 75 per cent. of the whole. It is commonly yellow, brown, or red from iron oxide, and occurs most frequently as the result of river-floods over alluvial meadows. From one of its chief uses it is known as *brick-earth*. When sandy—i.e. containing 60 to 70 per cent. of sand—it is added to stiff clays to lighten them, a process erroneously termed "marling," and thus some loams, such as those of the Upper Trias or Keuper, have been misnamed Marl (q.v.). Whether natural or artificial, most ordinary garden soil is a loam with a greater or less admixture of vegetable matter or humus (q.v.).

Loan is a species of contract analogous to bailment, but differing in this respect: that its subject is not to be redelivered to the lender or disposed of according to his direction, but is to be applied to the use and convenience of the borrower, he yielding to the lender afterwards an equal sum by way of repayment, in addition to which there is frequently an increase by way of compensation for the use of the sum advanced, which is known as *interest*, but when taken to an improper amount was denominated *usury*. In former times it was considered by many good and learned men that all increase by way of interest was against conscience, and there were laws in this country prohibiting an excessive interest, known as the "usury laws," which existed for a considerable period, the maximum rate being reduced to 5 per cent. by a statute passed in the reign of Queen Anne. During the course of the nineteenth century many statutes were passed progressively mitigating or narrowing the operation of the usury laws in deference to the new opinions gradually gaining ground regarding the interest on money. Under the influence of these views the total abandonment of all restrictions upon the rate of interest was at length resolved upon by the legislature, and was carried into effect by the Statute 17 and 18 Victoria, c. 90, which repealed all then existing Acts against usury. Where nothing but personal security is relied upon the usual documents evidencing a loan are a bill of exchange, promissory note, or I.O.U. [BAILMENT.]

Lobelia (named from Matthias de Lobel, a Flemish botanist, born in 1538, who passed most of his life in London and died at Highgate in 1616) is a considerable genus of herbs forming the type of an order, Lobeliaceæ, allied to the bell-flower tribe. They have an acrid narcotic latex; scattered exstipulate leaves; a superior, five-lobed calyx; a bi-labiate corolla, generally brightly coloured, white, blue, or scarlet; five epigynous stamens, with their anthers united round the style; a capsular fruit and albuminous seeds. Two species, *L. Dortmanna* and *L. urens*, are rare British plants; but they are most numerous in tropical and sub-tropical America. *L. Erinus*, trailing, with blue flowers; *L. cardinalis*, erect and scarlet-flowered; and others are garden favourites. *L. inflata*, "Indian tobacco," a North American species, in small doses is a useful expectorant in asthma; but in larger doses it is emetic or even poisonous.

Lobster, a Crustacean belonging to the order Thoracostraca. The Common Lobster (*Homarus vulgaris*) is caught in immense numbers round our coasts, where it is most commonly found on a rocky bottom. The young when just hatched differ very considerably from the parent, and it is only after having cast their shell several times that they become adult. The Spiny Lobster (*Palinurus*) and the Norway Lobster (*Nephrops*) are other common forms.

Local Action in electric batteries is caused by the presence in plates of commercial zinc of impurities in the form of small particles of metals

electro-negative to zinc, such as iron. These particles, when in the exciting fluid, form short-circuited voltaic couples with the zinc, and produce rapid waste. The action does not occur with pure zinc, and can be to a large extent obviated by amalgamating the surface of commercial zinc with mercury.

Local Government Acts and Board.

Numerous statutes were passed during the reign of Victoria giving to certain districts the power of adopting and carrying into effect the provisions of the Public Health Act, without the necessity of a provisional order of the former General Board of Health confirmed by Act of Parliament; and by a statute passed in the year 1871, the Local Government Board was constituted for the purpose of concentrating in one department of the Government the supervision of the laws relating to the public health, the relief of the poor, and local government. This Board may be said to have the control of the various local authorities entrusted with the execution of these laws in their respective districts, and its sanction is necessary for many purposes, *e.g.* the borrowing of money by sanitary authorities under the Public Health Acts. The Local Government Act, 1888, established County Councils throughout England and Wales. [COUNTY COUNCILS.]

Local Option, the power of regulating the liquor traffic with which the "Temperance" party desire to invest the inhabitants of each locality. It is usually proposed that the continuance or abolition of the traffic should be decided by a two-thirds majority of the ratepayers. The "Permissive Bill," embodying this proposal, was first introduced into Parliament in 1864; but the Liquor Traffic (Local Control) Bill, 1893, was the first instance of its inclusion in the Ministerial programme.

Lochleven, a lake, about ten miles round, in the county of Kinross, Scotland, contains four islands, on one of which was a priory, and on another are the remains of Lochleven Castle, famous as the prison of Mary Stuart after she had been taken prisoner at the battle of Carberry Hill.

Locke, JOHN (1632-1704), one of the greatest English metaphysicians, and the establisher of the empirical system of moral philosophy, was born at Wrington, in Somersetshire, and educated at Westminster and Christ Church, Oxford. In 1658 he took up the study of physic, and in 1666 became physician to Lord Ashley (the first Earl of Shaftesbury), in whose house he took up his residence, and who enabled and induced him to devote himself to politics and philosophy. Eventually his patron made him secretary to the Board of Trade, but he lost the appointment in 1674, and resided in France for his health from 1675 to 1679. In 1682 he accompanied the exiled Shaftesbury to Holland, and, falling under the suspicion of disloyalty, was deprived of his studentship in Christ Church by King Charles. After Monmouth's rising his person was demanded by King James's envoy at the Hague, so that he had to spend a year in hiding (1685-86),

when he wrote his first *Letter concerning Toleration*. At the Revolution he returned to England, and was made a Commissioner of Appeals. His celebrated *Essay concerning Human Understanding*, which had been in preparation for nearly twenty years, was published in 1690, when he also produced his second *Letter on Toleration* and his two *Treatises on Government* (one attacking Filmer (q.v.), the other adapting the Social Contract theory to justify the English revolution), in opposition to the doctrines of passive obedience. In the next year he wrote on finance; in 1692 he issued his third *Letter on Toleration*; in 1693 his *Thoughts concerning Education*. He was made a Commissioner of Trade and Plantations in 1695, which post he held until failing health, caused by asthma, induced him to retire. His latest works were the *Reasonableness of Christianity*, *Two Vindications* against the attacks of Dr. Edwards, who had charged him with Socinianism, and his controversial writings in answer to Dr. Stillingfleet's animadversions on the *Essay concerning Human Understanding*. In his great work he studied the origin of ideas and mental operations and affections by careful analysis of his own consciousness, with the result that he derived all knowledge from experience. Considering that a loose and inaccurate use of words was one of the main sources of error, Locke aimed with considerable success at being simple and clear in his style, and at investing with distinctness the notions with which he dealt; so that (in spite of a tendency to diffuseness) he exercised a great and beneficial influence on literary style, as well as on mental and moral philosophy. The declining portion of his life was solaced by the friendship of Lady Masham, the daughter of his intimate friend, Dr. Cudworth (q.v.).

Locker, WILLIAM, naval officer, was born in 1731, and entered the navy in 1746. He was made commander in 1762, and captain in 1768; and while commanding the *Lowestoft* in the West Indies he had as one of his lieutenants Nelson. After much further service he hoisted a broad-pennant in 1792 as commander-in-chief at the Nore, but early in the year following received the more congenial appointment of Lieutenant-Governor of Greenwich Hospital. There he died at the end of 1800.

Lockhart, JOHN GIBSON (1794-1854), a talented author and novelist, was born at Glasgow, and in 1809, when a student at Glasgow University, he gained an exhibition to Balliol College, Oxford. On leaving Oxford Lockhart went abroad, and on his return became a member of the Scottish bar; but he spent most of his time in writing. In conjunction with Professor Wilson (q.v.) he established *Blackwood's Magazine*. In 1820 he married the eldest daughter of Sir Walter Scott. He was editor of the *Quarterly Review* 1826-53. His works include *Spanish Ballads*, *Valerius*, *Reginald Dalton*, *Adam Blair*, and, above all, his *Life of Sir Walter Scott*. In 1843 he received the post of auditor to the Duchy of Lancaster, worth about £400. His granddaughter is the only lineal descendant of Sir Walter Scott.

Lock Jaw. [TETANUS.]

Locks in canals and rivers are used for raising or lowering vessels from low to high level water, or *vice versa*. At the place where, owing to the presence of a weir or otherwise, the level of the water changes, a sufficient length of the river or canal bed is provided with a gate at each end, opening in such a direction that the pressure of the water tends to keep them closed. The gates are provided with sluices, or openings which may be closed by slides. When the lock is full the upper gates can be opened to admit vessels; the gates being closed, water is allowed to escape through the sluices until that in the lock reaches the lower outside level; the lower gates can then be opened to allow vessels to go out, or those coming up stream to enter. The lock is then refilled by closing the lower gates and opening the sluices in the upper ones.

Lockyer, SIR JOSEPH NORMAN, F.R.S., born at Rugby in 1836, entered the War Office in 1857, became astronomical lecturer at South Kensington, and directed the eclipse expedition to Sicily 1870, and to India 1871. He is specially distinguished for his work in spectrum analysis. He has published *Studies in Spectrum Analysis* (1872), *Solar Physics* (1874), *Star-gazing* (1877), *Chemistry of the Sun* (1887), and is the editor of *Nature*. He was knighted in 1897.

Locomotive. The form of steam engine best adapted for actual locomotion is not the most efficient from the point of view of the economy of coal. The whole machinery, including furnace, boiler, and engines, must be compressed into small space, and must be arranged so that high speeds shall not endanger its stability. The ordinary type of locomotive has not altered much in general appearance since the general adoption of the "narrow" gauge for railways. The boiler is cylindrical and multitubular, of wrought-iron or steel, terminated at one end by the fire-box and at the other end by the smoke-box. The fire-box is of rectangular section, and holds the grate. It is made of copper, and is so arranged that the water of the boiler can circulate round a considerable portion of its surface. To support the great pressure that this incurs, the box is heavily stayed with ribs at its crown, the copper tubes acting as stays for the front. The chimney is short, and leads direct from the smoke-box. The steam cylinders are arranged in the front either underneath the fire-box or else at each side. The compound-cylinder principle has been successfully employed with locomotives, but is not yet general. The steam pipe gathers steam from near the top of a dome, where the steam is fairly dry; it passes down to the cylinders and ultimately to the exhaust in the smoke-box. The exhaust steam blows out in jets, which force a draught through the furnace and thus compensate for the shortness of the chimney. The slide-valves are regulated by a link motion (q.v.), which serves as a reversing gear. The power of the engine is also modified by a regulator valve in the steam pipe worked by hand, as is also the link motion. Goods engines used for heavy traffic have the

driving-wheels coupled up with two other pairs to avoid slipping on the rails. They are adapted for slow motion, and the driving-wheels are small. Passenger engines have large driving-wheels, and may have another pair of wheels coupled on. Driving-wheels vary in diameter from about five to seven feet. The *tender* carries fuel and water, and is also constructed with the most powerful brake on the train. [STEAM-ENGINE.]

Locomotor Ataxia, TABES DORSALIS, is a term applied to a disease one of the most characteristic symptoms of which is an ataxia or disorder of locomotion. The patient's gait somewhat resembles that of a drunken man; he raises his feet unduly high and brings them down to the ground with peculiar suddenness. He is unsteady, and sometimes is unable to maintain the standing posture when his eyes are closed. The legs are especially involved in this disease, but the arms may be affected, and sensation as well as movement may be implicated. Peculiar darting pains in the limbs are of frequent occurrence, and to them the term lightning pains has been applied. Pain in the region of the stomach with gastric symptoms (gastric crises) constitute another characteristic group of phenomena. Other symptoms are loss of "knee-jerk," affection of the joints, and a peculiar condition of the pupil of the eye, the aperture of the pupil becoming smaller when the stimulus of exposure to light is applied, but the normal contraction when the vision is accommodated for near objects not being observed (Argyll Robertson phenomenon). In some instances there is atrophy of the optic nerve with loss of sight. The disease begins in middle life, and runs a very protracted course. It is more common in men than in women. It is caused by a process of degeneration or sclerosis affecting the posterior columns of the spinal cord. In some instances it occurs in persons who have previously been the subjects of syphilis, and in them treatment by appropriate remedies may be productive of considerable benefit.

Locri, a Grecian people found on the Ægean coast opposite Eubœa (Locri Opuntii) and between Phocis and Ætolia (Locri Ozolæ). The former founded (B.C. 683) the colony of Locri Epizephyrii, a city of Lower Italy, now Gerace, north of the promontory of Zephyrium.

Locusts, a group of Orthoptera (q.v.) forming the family *Locustidae*, though many insects belonging to other groups are often included under this term: thus many of the so-called locusts of Australia and America really belong to the Cicadas. The locusts live on vegetation, and, as they occur in enormous hordes, they do serious damage in countries where they occur. They are also large in size, and include some of the bulkiest of known insects. Some of the largest live in America; but, as they do not occur in such numbers, do not do nearly as much damage as the smaller brown locusts of Asia, Africa, and the south of Europe, which measure only about five inches in expanse of wing. When an army of locusts is on the march they go straight forward, devouring everything along the line, and often completely

devastate whole districts. They can be kept in check owing to the fact that they always travel in a straight line, and cannot fly well; a comparatively low obstacle thus checks their progress. In Cyprus they used to do enormous damage to the crops, but since the British occupation have been almost exterminated by a system of pits and fences.

Locust-Tree (*Robinia Pseud-acacia*), the False Acacia, is a leguminous tree, reaching 50 or 80 feet in height, native of the United States. Its roots have the smell and taste of liquorice, but are poisonous. Its wood is yellowish, but when only five years old turns brown at the heart, and is hard and durable. The leaves are deciduous and imparipinnate, with spinous stipules, and the flowers are in pendulous racemes of white papilionaceous blossoms. The wood is useful for posts and tree-nails, but splinters. The fruit of another leguminous tree, *Ceratonia Siliqua*, is known as Locust-beans. [CAROB.]

Lode. [MINERAL VEINS.]

Lodestone, or MAGNETITE, is an oxide of iron having the composition Fe_3O_4 . The name is derived from its use as a compass or "leading-stone" by mariners. It is frequently, but not always, found in a magnetised condition, and was once regarded as an object of great and mysterious interest. [MAGNETITE.]

Lodge, THOMAS (1556-1625), romance-writer and poet, born in Lincolnshire of a respectable family, went to Trinity College, Oxford, as a servitor. After leaving college he became a law-student at Lincoln's Inn, but took part in two naval expeditions, on the first of which he wrote the euphuistic romance of *Rosalynde*, on which Shakespeare based his *As You Like It*. He wrote a tragedy, *The Wounds of Civil War* (1594), and in conjunction with Greene a satirical mystery-play called *A Looking-Glass for London and England*. His earliest work was *A Defence of Stage Plays, in Three Divisions* (1580), which was answered by Gosson. Lodge wrote several sonnets, satirical poems, and pastoral tales. He died of the plague.

Lodge, SIR OLIVER JOSEPH (b. 1851) was educated at University College, London. From 1881 to 1900 he was Professor of Physics at University College, Liverpool. In 1900 he was appointed Principal of Birmingham University. He is specially distinguished in electricity, on which subject he has written several books. By his researches, and especially in the invention of the coherer, he has considerably advanced wireless telegraphy. He has also published some theological works, and devoted much thought to problems of telepathy. In 1902 he was knighted.

Lodgings. Lodgings are part of a house, and may be let and taken in the same manner as lands and tenements. Usually, however, they are let either by written agreement or verbally, and are either furnished or unfurnished. A written agreement is often desirable to avoid dispute. Formerly a lodger's goods were liable to the rent of the

house, and could be distrained upon therefore even if the lodger's rent were duly paid; but by the Statute 34 & 35 Vict., c. 79, passed for the protection of lodgers' goods, it is provided that if any superior landlord shall levy a distress on any furniture, goods, or chattels of any lodger for arrears of rent due to the superior landlord by his immediate tenant, the lodger may serve the superior landlord, or the bailiff or other person employed by him to levy such distress, with a declaration in writing made by the lodger setting forth that the immediate tenant has no right or beneficial interest in the furniture, etc., so distrained, and that such furniture, etc., are the property or in the lawful possession of the lodger, and also setting forth whether any and what rent is due from the lodger to his immediate landlord, and the lodger may pay to the superior landlord that rent, if any, so due as last assessment, or so much thereof as shall be sufficient to discharge the claim of the superior landlord. And it is also enacted that any payment made by any lodger pursuant to the above provision shall be deemed a valid payment on account of any rent due from him to his immediate landlord. Compensation may be awarded up to £15 by a police magistrate for wilful damage done by lodgers.

Lodhi, an agricultural Hindu caste widespread throughout the Central Provinces, India; two branches, those originally from the Ganges and Jumna valleys, and the Raepore or Maher Lodhis; "fine, powerful men, living always in the open air, and following no profession but that of the plough." (A J. Lawrence, *Report on the Wyngunga*, p. 69.)

Loess, a loose, fine-grained rock, generally pale-coloured, composed of clay, sand, and occasionally lime, and containing a few land-shells and plant remains, but neither sea-shell nor pebble. It occurs over wide areas, especially on continents, independent of existing river-valleys, and is occasionally converted by a copious admixture of humus into rich "black lands," as in Siberia and Western Canada. The prairies between the Rocky and the Alleghany ranges seem to be composed of it, as are also perhaps the "pusztas" of Hungary and an immense area in China. The river Hoang-ho cuts terraced valleys in it to a depth of 1,000 feet, the sides of these valleys having been excavated into underground villages by a teeming population to avoid the extremes of heat and cold. The river gets its name (*hoang* meaning "yellow") from the abundance of fine sediment suspended in its waters, as does also the Yellow Sea (*Hoang-hae*), which receives this sediment. Loess would seem to be, at least mainly, accumulated by wind action.

Loewe, JOHANN CARL GOTTFRIED (1796-1869), a German composer, studied at Halle, and, having settled at Stellen, became musical director and organist to the city. He visited Norway, Sweden, and France, and sang and played in London (1847) before the English court. He composed sixteen oratorios, five operas (one performed), and numerous pianoforte pieces. His ballads, however, were his most important productions, many being very beautiful.

Lofoden, or LOFOTEN, the name of a chain of islands situated on the N.W. coast of Norway. The group includes the islands of East Vaay, West Vaay, Karstad, and Moskenias, and the islands of the Vesteroalen group are also usually included under this name. In the months of January and March shoals of cod-fish visit their waters, and many are caught. The chief export is cod-liver oil.

Log. 1. (Or LOG-BOOK.) A nautical diary, kept in proper form, of daily occurrences.

2. A device for ascertaining the rate of a ship's motion through the water. The common log, invented early in the 17th century, consists of a piece of board about a quarter of an inch thick, and shaped like the sector of a circle. This is fastened in a peculiar way so as to offer the greatest possible amount of resistance to the water, by means of two "legs," to a light line about 150 fathoms long. The line is wound on a reel at the stern of the ship, and, when the log is used, it is allowed to run freely overboard for a given period, which is measured with a log glass. The length is marked by knots at 50-ft. intervals. The number of knots that run out in half a minute are the number of "knots" (i.e. geographical miles) at which the ship is moving per hour. Many more scientific logs have lately been invented, but few give much better results than the common log when it is employed by experience and common-sense.

Logan, SIR WILLIAM EDMOND (1798-1875), Canadian geologist, born in Montreal, was for ten years in a London office. He then went to Wales, where his geological studies attracted attention. From 1843 to 1871 he was chief of the geological survey of Canada, and he also assisted in the survey of Britain. He was knighted in 1856, and received the Wollaston Medal of the London Geological Society. His writings appear in the reports of the Canadian survey, and the *Proceedings* of the British Association and of the Geological Society.

Logarithms. The definition of a logarithm is obtained from the equation $a^x = m$, where x is said to be the logarithm of m to the base a , or $x = \log_a m$. If $a^x = m$ and $a^y = n$, then $a^x \times a^y = a^{x+y} = mn$. [INDICES.] From definition, therefore, $x + y = \log_a mn$, and $\therefore \log_a mn = \log_a m + \log_a n$. Hence we see that the logarithm of the product of any numbers is equal to the sum of the logarithms of the numbers; and similarly it can be shown that the logarithm of a quotient is the logarithm of the numerator diminished by the logarithm of the denominator. Also $\log_a m^r = r \log_a m$, whether r be integral or fractional. The use of logarithms very much simplifies calculations, as multiplication is done by means of their addition, division by subtraction, and extraction of roots or raising to powers by their division or multiplication. For convenience in ordinary calculation, the base is taken as 10, and is generally not expressed; thus the equation $\log 12 = 1.07918$ means $\log_{10} 12 = 1.07918$. The integral part of the logarithm is called the *characteristic* and the decimal part the *mantissa*, and

with the base 10 all numbers containing the same figures, and only differing in the position of the decimal point, have the same mantissa. When the logarithm of a fractional number is required, the mantissa is still kept the same by writing a negative number for the characteristic; thus, $\log 1.2 = 0.07918$, $\log .12 = \overline{1}.07918$, $\log .0012 = \overline{3}.07918$. The negative sign is written over the characteristic, to indicate that it alone is negative, the mantissa remaining positive. The characteristic can be told by inspection. If the number is greater than 1, the characteristic is one less than the number of digits in the integral part. If the number is fractional, the characteristic is one more than the number of ciphers to the right of the decimal point. In tables of trigonometrical functions the logarithms are generally increased by 10, to avoid the use of negative characteristics. This is generally expressed by writing *L* instead of *log.*; e.g.

$$L \tan 28^\circ = 9.7257.$$

In order to change from a system of logarithms with one base *a*, to a system with another base *b*, we have

the equation $\log_b m = \log_a m \times \frac{1}{\log_{ab}}$, the constant multiplier $\frac{1}{\log_{ab}}$ being called the *modulus* of

the system with base *b*, with regard to the system with base *a*. In algebraical work logarithms to the base *e* are the ones which naturally occur—appearing in the Exponential Theorem—and hence in theoretical work the base *e* is always used—

$$e = 1 + \frac{1}{1} + \frac{1}{1.2} + \frac{1}{1.2.3} + \frac{1}{1.2.3.4} + \dots = 2.71828 \dots$$

The system of logarithms to the base *e* is known as the natural or hyperbolic system, and is due to Napier, while the common or decimal system was invented by Briggs.

Logic (Gk. *logos*, "reason," "argument") may be roughly defined as the study of the laws or forms of correct thinking. Since thought is at bottom the instrument of all knowledge, it soon became necessary to determine whether all conclusions of thought were equally correct. Logic, in other words, begins with the beginning of science. The problem as to what are the laws or forms to which correct thinking must conform presented itself at an early date to the Greeks and obtained a provisional solution from both Parmenides and Plato. With them, however, logic is not yet separated from general philosophy. Aristotle is the first to systematise logic, and to assign it a department of its own. The real question which Aristotle attempts to solve in his *Analytics* (the term *Logic* is due to Zeno the Stoic) is what are the *conditions of science*. Science exists as systematised knowledge. What presuppositions are necessary to explain its existence? And this question has remained the problem of logic for most succeeding thinkers. This aim of Aristotle's logic was obscured in succeeding ages by the attention which was concentrated on the account which he gives of the formal laws of thought. The whole mechanism of

deductive logic, depending on the doctrine of syllogism (q.v.), was taken over by the schoolmen from Aristotle, and little attention was paid to the other parts of his logical system. This deductive logic was well suited to mediæval thought. Science in the modern sense did not exist, and all that was required of logic was to evolve the correct consequences of the propositions of the faith, which, according to the theory of the mediæval Church, were given by revelation. Hence the syllogistic logic did not lay down a method of arriving at knowledge, but merely analysed conceded general propositions, and rendered explicit what was implied in them. Bacon's *Novum Organum* is a revolt against this deductive logic, and is, in the main, a return to the real views of Aristotle. Logic is to be the instrument of scientific discovery, and, as no general proposition can be taken for granted, it must be obtained by *experiment* in accordance with the new inductive method, which assembles a number of particular allied instances, and discovers the law which underlies them. Inductive logic, which begins with Bacon, is most fully worked out by J. S. Mill in his *System of Logic*. Since Bacon two principal views have obtained as to the office of logic. (1) There are the formal logicians (e.g. Hamilton, Mansel), who have rehabilitated the scholastic logic. Under the influence of Kant, Mansel elevates formal logic into a speculative science, which would exist and investigate the laws of unerring thought, even if all men were unerring thinkers. (Cf. for criticism, T. H. Green, *Works*, ii. 158.) (2) There are also other logicians who hold that logic is the science of the method of knowledge (e.g. J. S. Mill, Kuno, Fischer, Sigwart, Wundt). As to *what* the method of knowledge is, each inquirer will differ according to his view as to what the object of knowledge is; and this is a question for metaphysic to those who believe in metaphysic, and for psychology to those who, like Mill, believe that nothing is required to render reasoning possible but the senses and association. An exception must be claimed from both these two classes for Hegel, who, with his theory of the world as a process of thought from the abstract to the concrete, identifies logic with metaphysic.

[For the whole subject see Jevons' *Elements of Logic*; for deduction, Mansel's edition of *Aldrich*, Oxford (1862); for induction, Mill's *System of Logic*. For an attempt to reduce logic to an algebraical notation see J. Venn, *Symbolic Logic* (1881); also see SYLLOGISM, INDUCTION, DEDUCTION.]

Logon, a large Negro nation of Central Sudan, whose territory lies about 40 miles S.E. of Lake Chad, between Bornu in the north and Musgu in the south; are akin to the Makaris of Bornu, but of darker colour and generally of more pronounced Negro features. They are fishers, agriculturists raising fine crops of cotton, tobacco, indigo, and sorghum, and are specially skilled in straw-plaiting—their mats, baskets, hanging doors, and other plaited objects being highly prized throughout Sudan. They have an organised system of government under a *Miarai* ("king"), who is tributary to the Sultan of Bornu, and who is required to consult

a council of five dignitaries in all affairs of importance.

Logwood, the wood of *Hæmatoxylon campechianum*, a leguminous tree with paripinnate leaves and racemes of yellow flowers, native to Yucatan and some other parts of Central America. The tree reaches 40 feet in height; but the deep red heart-wood, which is very hard and heavy, occurs in commerce in logs 3 feet long. These are cut into chips and ground, furnishing one of the best deep red and black dyes, owing to the presence of *hæmatoxylin*. It is used by calico-printers and cloth-dyers; by hatters for black hats; and in some inks. The tree is naturalised in Jamaica, whence 115,000 tons are exported annually. Our imports amount to 50,000 to 70,000 tons.

Lohâni (LAWÂNI), a large section of the Afghan Povindahs, with four divisions—Daolat, Pani, Mian, and Marwâti—and 64 minor groups. The term Lohâni, meaning "travellers," has reference to their periodical visits to India for trading purposes, and in this sense it is often applied to all the Povindah nation.

Lohengrin, a mythological hero of Germany, whose exploits are dealt with in a 13th-century poem edited by Rückert in 1857, and in Wagner's opera of *Lohengrin*. The son of Parzival, Lohengrin was a knight of the Grail, and was conveyed by a swan under King Arthur's orders to Mainz, where he rescued from an oppressor and married the Duke of Brabant's daughter Elsa, who was forbidden to search into his origin. After his return to Germany from an expedition with the Emperor against the Saracens and Hungarians, his wife questioned him on the forbidden topic. Her third attempt was successful; she gained the knowledge she sought, but lost her husband, who was carried away by the swan.

Lohita, a collective name of numerous hill tribes on the Burma-Assam frontiers; they are of Tibeto-Burmese stock, but present great diversities in their physical appearance, speech, usages, traditions, and grades of culture. Chief branches: Bodo (Borro), Garo, Changlo, Miri, Sing-pho, Mikir, Naga, Khyeng, Karen, Zabaing.

Loir. [DORMOUSE.]

Loir, RIVER, the ancient *Lidericus*, rises in the lagoon of Cernay and flows for a course of 150 miles through Eure-et-Loir, Loir-et-Cher, and Sarthe, joining the river of that name north of Angers.

Loire. 1. The ancient LIGER, the longest river in France, rises in the Cevennes, in the department of Ardèche, and has a course of 626 miles, first in a N. and N.W. direction through central France to Orleans, then S.W. to Tours, and then generally W. to the Bay of Biscay, receiving on the right bank, among other tributaries, the Nièvre and the Marne, and on the left the Allier, Cher, Indre, and Vienne. It has a drainage basin 45,000 square miles in extent, and approaching in the N.E. to within 6 miles of the Seine basin. The river is tidal as far as Nantes (35 miles), and is navigable for 550 miles; but, rising at a height of 4,500 feet, it is practically

a mountain stream, and is well-nigh unnavigable for six months in the year. Canals connect the river with the Seine, the Saône, and Brest.

2. A department of central France, containing 3 arrondissements, and formerly part of Lyonnais, takes its name from the Loire, which here flows through ravines and plains, which were the beds of ancient lakes. It is 78 miles long, 43 miles broad, and contains 1,838 square miles. In the west, the Forez Mountains separate the Loire and the Allier, and in the east the Rhone and Loire basins are separated by the hills of Lyonnais and by offshoots of the Cevennes. The Loire valley is unfruitful, but the department is rich in coal and iron, the St. Étienne coal-basin being the second in France. At St. Étienne, the capital, is a national arms factory, and here the heaviest steel castings are made for the navy. Much silk also and cotton are manufactured, as well as woollens, linen, glass, paper, and leather. About half of the department is arable, and produces wine, fruits, fodder, and potatoes. Timber and turf are obtained from the pine woods, and there are mineral springs at St. Galmier and elsewhere.

Loire, HAUTE, a department of central France, part of the old duchy of Auvergne and the county of Forez. It contains 1,915 square miles, and is crossed in the N. by the Loire, and N.W. by the Allier. Most of the department is in the Loire basin, and consists of a plateau deeply indented by river valleys, and having a cold climate by reason of its height and the winds from the Cevennes. Volcanic action is very apparent, especially in the mountain parts, which belong to the Cevennes, and rise in Mont Mézenc to a height of 5,700 feet. Lace-making is one of the principal industries, others being the manufacture of wool, cotton, flax, silk, gold, and silver. There is much agriculture, and coal and building-stone are worked. The capital is Le Puy.

Loire Inférieure, a maritime department of western France, containing 5 arrondissements, and forming part of old Brittany, and Retz on the left bank of the Loire. It has a coast-line of 78 miles, and contains 2,600 square miles. The Loire traverses the west and forms an estuary, and the Vilaine is part of the N.W. boundary. The surface is flat and fertile, and is much intersected by canals, while salt marshes occur on the coast. The Lake of Grandlieu in the south contains 26 square miles. There are oak and pine forests, and granite, slate, and limestone are quarried. The vineyards produce 30,000,000 gallons of wine, and the orchards 4,500,000 gallons of cider. Among the productions are corn, beet, potatoes, hemp, and fodder, and bee-keeping forms a profitable occupation. The chief industries are shipbuilding at Nantes, iron-, sugar-, and glass-working, the canning of fruit and sardines, and there is much fishing, and export trade. St. Nazaire is the port, Nantes the capital.

Loiret, a department of Central France, part of old Orleanais and Berri. It is on the Loire, has 4 arrondissements, and contains 2,600 square miles, being for the most part a fertile upland plain,

producing corn and wine. The southern part is sandy, and belongs to the district called Sologne, which is now being drained and planted with pine. There are large forests, and the chief pursuits are the keeping of cattle, sheep, and bees. Other industries are the manufacture of pottery, porcelain, sugar, vinegar, and soap. Orleans is the capital.

Loir et Cher, a department of west central France, part of old Orleanais, has 3 arrondissements, and contains 2,450 square miles. It is mostly a plain, traversed in the S.W. for 37 miles by the Loire, and in the N.W. by the Loir for 56 miles, and the Cher for 50 miles, the latter rivers flowing through pleasant valleys. The productions are corn, fruit, wine, beet, timber, and the people occupy themselves in fishing, and keeping bees and poultry. Building-stone and pottery-clay are found, and the department formerly exported quantities of gun-flints. Cloth-working, glove-making, tanning, and glass-, paper-, and pottery-making are the chief industries. The capital is Blois.

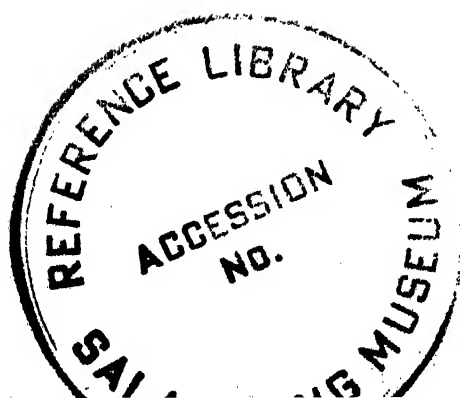
Loki, a god of the Scandinavian mythology, in which he plays a part somewhat analogous to that of Mercury in classical mythology. He was older than the Æsir, on whom he played many tricks, and was handsome, wise, and crafty, and the cause of much strife. Among his deeds was the bringing about of the death of Balder.

Lollards, the name given to the English followers of John Wyclif (q.v.), is probably derived from the Low German verb *lollen* or *lullen*, "to sing," and may have been applied to the heretics in consequence of a supposed fondness for psalm-singing. It was used in Holland in the early part of the 14th century, before it found its way to England. Wyclif's views were eagerly accepted by many of the nobility; they also found some favour with the mercantile class, but it was in the University of Oxford that they fell on the most congenial soil, and here Wyclif gained many disciples, the most eminent being Nicholas Herford, who assisted him in his translation of the Bible. The religious revival was not, however, confined to the upper and middle ranks of society, for the itinerant preachers instituted by Wyclif under the title of "poor priests" carried his doctrines through the length and breadth of the land. In the minds of the ignorant masses the yearning for spiritual freedom became confused with vague notions of social and political equality, and was certainly one of the causes which led to the Peasants' Revolt in 1381. Mainly in consequence of that rising John of Gaunt and other powerful supporters of Wyclif withdrew their protection from him. In the same year the first Act against the Lollards was passed, and in 1382 the movement was suppressed in Oxford. Nevertheless, Lollardism continued to thrive during the ten years which followed Wyclif's death. The petition presented to Parliament by the Lollards in 1395 shows how closely their views were modelled on his teaching. Among other points they object to the doctrine of transubstantiation, clerical celibacy, auricular confession, and prayers for the dead, denounce Mass as impious, and demand that the Church should be deprived of its temporal possessions and placed in

subjection to the king. The accession of the House of Lancaster was fatal to Lollardism. The success of Henry IV. was in great measure due to the support of the Church, headed by Archbishop Arundel, a bitter foe of the Lollards. Moreover, the kings of this line, especially Henry V. and Henry VI., seem to have been personally attached to the doctrine and ritual of the Church. The statute *De Hæretico Comburendo* was passed in 1401 [HERESY], and although only two persons—William Sawtre and John Badby—were put to death under it during the reign of Henry IV., a projected rising in 1414 and the dangerous influence exercised by Sir John Oldcastle (q.v.), who was captured and executed in 1417, gave rise to more severe measures. After this little is heard of the Lollards, but they appear to have lingered on till the time of the Reformation, and probably contributed in some degree to its rapid progress in England.

Lolo, collective Chinese name of a large group of semi-independent hill tribes in the highlands of west and south-west China. They are numerous, especially in Yunnan, Kwei-cheu, and within the great bend formed by the Kinsha-Kiang river between Sechuen and Yunnan. The word has no meaning in Chinese, unless it be a reduplicate form like *bar-bar* to denote "stammerers," i.e. people speaking an unintelligible language. Those recognising the Chinese authorities are called *Pè* ("White"), or *Shuh* ("Baked"), while the independent wild tribes are *He* ("Black"), or *Sen* ("Raw"). The latter are regarded as true aborigines, quite distinct in type from all the surrounding Mongolic populations, taller than most Europeans, well-built, muscular, deep-chested, with arched but rather broad nose, rather prominent cheek-bones, and very fair complexion, described by some observers as "white." Those visited by Mr. Colborne Baber seemed to recognise him as one of their own race, and there are other reasons for supposing that these Lolos are not of Mongolic, but of Caucasian stock, akin to the Cambojans and other Caucasian peoples of Indo-China. Some have developed a certain degree of culture, and possess a curious writing system, of which several MSS. have reached Europe, some beautifully written on silk. This script has been identified with that of the Harapa stone seal, the prototype of numerous Asiatic alphabets, such as the Corean, Hifumi of Japan, Lampung, Batta, and Rejang of Sumatra, Mangkassar of Celebes, as well as the Indo-Pali itself. In other respects the Lolo, who call themselves *Tukia* ("Aborigines") or *Chinsi* ("Parents"), are little removed from the savage state, eating rats, birds of prey, and even carrion, cooked in a large pot, from which all help themselves with their hands. Much care is bestowed on the hair, which is gathered in front like a chignon or a horn, 8 inches long, and wrapped in a strip of black cotton. (E. C. Baber, *Travels, etc., in Western China*, 1882.)

Lombard, PETER (circa 1100–60), a mediæval schoolman, born near Novara and educated at Bologna. He went to France under the patronage



of Bernard of Clairvaux, and was appointed professor of theology at Paris, becoming in 1159 Bishop of Paris. He was called "Magister Sententiarum" from his chief work, a collection of opinions from the Fathers on points of doctrine, which was long a text-book in schools of theology.

Lombards. [LOMBARDY.]

Lombardy, an Italian province, forming a plain between the Alps and the Po, having Venice on the E. and Piedmont on the W. It belongs to the Po basin, is alluvial in nature, and is traversed by many streams and canals. Conquered by Rome in 222, it formed the province of "Gallia Cisalpina," it belonged in later times to a succession of powers till it fell into the hands of the Lombards, and was finally re-taken into the empire by Charlemagne. Still later it was divided into duchies, and city-republics, which grew rich and were the homes of freedom. Internal quarrels, however, brought about their downfall. It then for a time belonged to the Dukes of Milan, but at the death of the last duke in 1447 it became a bone of contention between France and the Emperor, falling eventually to the latter. From Charles V. it passed to Spain, which held it till 1713. It then became Austrian, and, though diverted by Napoleon, was restored to Austria in 1815, remaining in that country's possession until made part, in 1859, of the new kingdom of Italy. It is now divided into 8 provinces.

Lomond, LOCH, a long, irregularly-shaped lake in the counties of Dumbarton and Stirling, Scotland, having a length of 22 miles, and a width varying from a few feet in the N. to 5 miles in the southern part, and a depth varying to an extreme of 630 feet, and containing 27 square miles. It receives several streams, and its southern extremity communicates with the Clyde by the Leven. The wider part contains many picturesque wooded islands, and the loch is surrounded by heights, Ben Lomond, on the eastern shore, rising to a height of 3,192 feet. The waters abound in pike, perch, and trout.

Lomwe, a people of east Africa S. of the river Luli, between Mozambique and Lake Shirwa, are quite distinct from the Mozambique Makuas, with whom they were long confounded owing to fusions that have taken place between the two nations along the borderlands. The heart of their territory is occupied by the Namuli uplands, one of the most romantic and healthy districts in the whole of Africa. They were first visited (1879-83) by Consul H. O'Neil, who found them, despite their evil repute, to be a peaceful, industrious people, skilled in cotton-weaving and excellent workers in iron, altogether superior in most respects to their Makua neighbours. (H. O'Neil, *Journey from Mozambique to Lakes Shirwa and Amaramba*, in *Proceedings of the Royal Geographical Society*, November, 1884.)

London. 1. The capital of England and of the United Kingdom, on the banks of the River Thames, now reaches from Poplar and Plumstead in the east to Hammersmith and Putney in the west, and from the hills of Hampstead and Highgate in the

north to those of Sydenham and Norwood in the south. This is a stretch of from ten to fourteen miles from east to west, and about ten miles from north to south. The name originally belonged only to the City; but gradually it has been applied to the whole town. By the Local Government Act of 1888 the Metropolitan area (defined by the Act of 1855, and from that year until 1888 the area under the jurisdiction of the Metropolitan Board of Works) was constituted a county of itself. The area comprised within the administrative county of London, which includes the City, extends over 74,839 acres. The Police district, which includes the outskirts and may be described as "Greater London," consists of an area of 441,587 acres.

Calculations have been made of the population of London at various periods before the official censuses were taken, and in 1631 the Lord Mayor reported to the Privy Council that the number of mouths in the City of London and the liberties was 130,268. The figures of the population of London for some of the decennial periods in the 19th century are as follows:—1801, 864,035; 1821, 1,227,590; 1841, 1,872,365; 1851, 2,362,236; 1861, 2,803,989; 1871, 3,254,260; 1881, 3,815,544; 1891, 4,211,056; and in 1901, 4,536,063. Previously to the Reform Act of 1885 London returned 23 members to Parliament for the following boroughs:—City 4, Westminster 2, Marylebone 2, Finsbury 2, Tower Hamlets 2, Hackney 2, Southwark 2, Greenwich 2, Lambeth 2, Chelsea 2, London University 1. By the Act of 1885 the number was more than doubled. The representation of the City was reduced from four to two, but the remaining seats are supplied by single member constituencies, and the list of these in alphabetical order is as follows:—Battersea 1, Bethnal Green (North-East 1, South-West 1), Camberwell (North 1, Peckham 1, Dulwich 1), Chelsea 1, Clapham 1, Deptford 1, Finsbury (East 1, Central 1, Holborn 1), Fulham 1, Greenwich 1, Hackney (North 1, Central 1, South 1), Hammersmith 1, Hampstead 1, Islington (North 1, West 1, East 1, South 1), Lambeth (North 1, Kennington 1, Brixton 1, Norwood 1), London University 1, Marylebone (North 1, South 1), St. George's, Hanover Square, 1, St. Pancras (North 1, East 1, West 1, South 1), Shoreditch and Hoxton 1, Haggerston 1, Southwark (West 1, Rotherhithe 1, Bermondsey 1), Strand 1, Tower Hamlets (Whitechapel 1, St. George's 1, Limehouse 1, Mile End 1, Stepney 1, Bow and Bromley 1, Poplar 1), Westminster 1, and Woolwich 1.

The government of London has undergone many changes of late years. The Local Government Act of 1888 constituted the London County Council, which superseded the Metropolitan Board of Works. The Council, over and above the duties imposed upon the Board, has many important functions to perform. The whole London area, including the City, is styled the administrative county of London.

The London Government Act of 1899 replaced the vestries and district boards constituted under the Metropolis Management Act of 1855 by twenty-eight borough councils, the number

of units of local government being at the same time reduced by the same Act to about one-half the original number.

London is of great antiquity, and was originally a clearing out of a vast forest, remains of which still existed in the reign of Elizabeth, and the recollection of which is kept alive in the name of St. John's Wood. Bones of the mammoth have been dug up in the neighbourhood of Euston Square, and traces of a manufactory of flint instruments have been discovered at Stoke Newington. Pile buildings have been found near London Wall to the north and in Southwark Street to the south of the river. Several watercourses ran from the northern heights to the Thames, but traces of these must now be sought in the sewers.

The very existence of a British London has been denied by Dr. Guest and others, but the evidence seems to be decidedly in favour of the view that London was a commercial town in British times. Two points in favour of this view may be mentioned here: (1) the origin of the name itself is undoubtedly British, and (2) when we first read of Roman London in Tacitus it is described by the historian as the mart of trade so early as A.D. 61. If the town was founded by the Romans there was little time by that year for it to have grown into a place of commercial importance. British London, however, must have extended over a very small area, and we have reason to believe that the earliest Roman London did not extend westward of Leadenhall. No funeral relics have been found between Gracechurch Street and the Tower; but cemeteries once existed in Cheapside, on the site of St. Paul's Cathedral, and close to Newgate, as well as in various places known to have been included in the later Roman London, which probably extended over the area for many centuries afterwards included within the London walls.

We thus know that the town was constantly increasing and growing in importance, but few or no incidents are recorded save that the title Augusta was added to the name Londinium in the latter years of the Roman occupation.

For a century and a half after the Saxon invasion the history of London is a blank. Dr. Guest supposed that the town remained for a period desolate and uninhabited owing to the repugnance of the Saxons to walled cities. This, however, is very improbable, and we have no record of the driving out of the Romanised British who inhabited London. It is easier to believe that the Saxons in time got over their repugnance and gradually assimilated themselves with those who carried on the trade of the place. Bede describes London as being in A.D. 604 the metropolis of the East Saxons and an emporium of many peoples. Danes and Saxons were constantly fighting for the possession of London until, in the year 886, King Alfred was allowed undisputed possession and rebuilt its walls. The defeated chiefs after the battle of Hastings retired upon London, and William the Conqueror followed them, although he did not lay siege to the city. "The best men of London," seeing the hopelessness of their cause, repaired to Berkhamstead, where they submitted themselves and swore fealty to the

conqueror. The citizens were benefited by their submission, and in the second year of his reign King William granted them a charter, which still exists. One of the king's first works was the building of the Tower to overawe the Londoners.

Almost immediately after the conquest the building taste of the Norman exhibited itself; St. Paul's Cathedral was rebuilt, and many new ecclesiastical foundations came into being. The number of monasteries built in the reign of Henry I. was so great that almost all the labourers of the country are said to have become bricklayers and carpenters. The distinctive feature of Plantagenet London was the coming of the friars in the thirteenth century and it is not easy to understand how room could have existed within the walls for the extensive building of the Black, the White, and the Grey Friars.

During the Tudor period the monasteries which had taken such firm root in the land were suppressed and many troubles followed therefrom. One effect was to leave large portions of the city almost in ruins. Gradually this evil was overcome, and hospitals took the place of monasteries and friaries. How wild the surrounding country was may be guessed from a proclamation of Henry VIII., the object of which was "to preserve the partridges, pheasants, and herons from his palace at Westminster to St. Giles's in the Fields, from thence to Islington, Hampstead, and Hornsey Park." The settled character of Elizabeth's reign caused a change in this respect. Suburbs extended on all sides, and citizens built themselves residences in Middlesex, Essex, and Surrey. But Elizabeth found it necessary to issue a proclamation in 1580 for bidding any one to build upon ground which had never been built upon before within the memory of man; the extension of London being deemed to be full of evil, as spreading the plague, causing a scarcity of victuals, etc.

London did not change very much during the early Stuart period, although great fears were felt on account of its rapid growth. In 1630 Charles I. issued a proclamation in which "the erection of any building upon a new foundation, within a limit of three miles from any of the gates of the City of London or palace of Westminster," was forbidden. Country magnates were not allowed to remain in London without special permission, and in 1635 Mr. Palmer, a large landholder in Sussex, was fined by the Star Chamber £1,000 for living in London longer than the period prescribed in the proclamation of June 20th of that year.

At the Restoration a great change took place in the growth of the town. The Royalists who returned to their native country did not care to take up their residence in the old family mansions in the City, but founded new ones in Covent Garden, Spring Gardens, and St. James's. The West-End greatly increased in size, and, with few exceptions, the inhabitants of the City were confined to those who made their money there. This westward exodus was greatly helped forward by the Fire of London in 1666, when a total clearance was caused equal to an oblong square of a mile and half in length and half mile in breadth. In the fire eighty-five out of ninety-eight parish churches within the

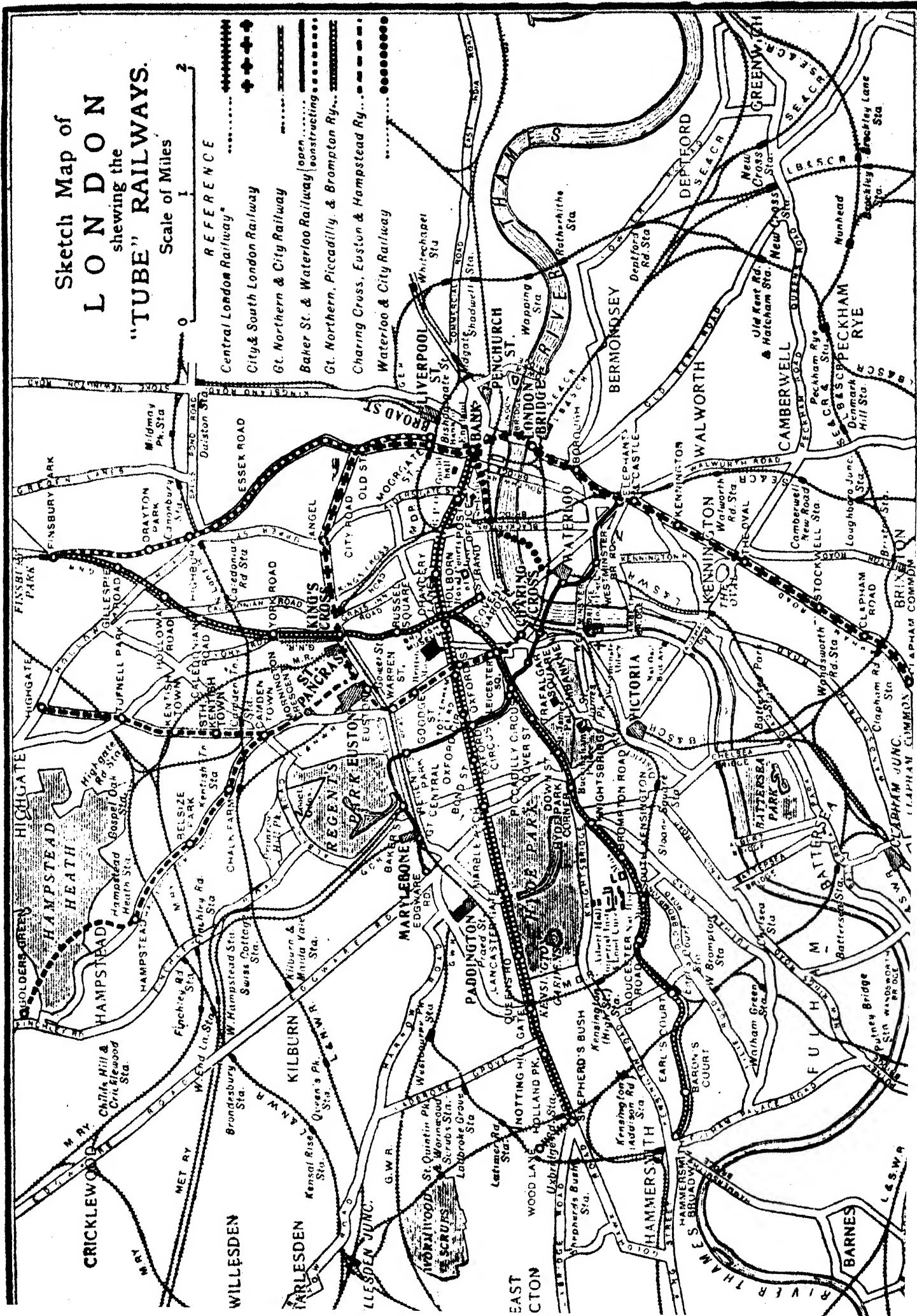
Sketch Map of L O N D O N showing the "TUBE" RAILWAYS.

Scale of Miles

0 1 2

REFERENCE

- Central London Railway
- City & South London Railway
- Gt. Northern & City Railway
- Baker St. & Waterloo Railway (open)
- Gt. Northern, Piccadilly & Brompton Ry. (constructing)
- Charing Cross, Euston & Hampstead Ry. (open)
- Waterloo & City Railway



walls were burnt down. The way in which this terrible calamity was met does the greatest credit to the manliness of the Londoners. They did not stand still and bewail their sad condition, but set to work at once to repair the misfortune that had come upon them. The City was rapidly rebuilt, and, although we may regret that the architectural plans proposed by Wren, Evelyn, and others, were not carried out, we cannot but marvel at the excellent spirit evinced by all and the few disputes that occurred, owing to the regulations adopted and the wisdom of the judges who were appointed to carry these out.

In the 18th century there was a considerable extension of building operations in the West-End, and a district north of Oxford Street was commenced, but in the middle of the century a farm still existed behind the British Museum. Near the end of the century the villages of Hackney, Islington, Stepney, Hoxton, St. Pancras, Marylebone, Paddington, Knightsbridge, and Chelsea were all known as country outskirts of the town.

At the beginning of the 19th century grapes were ripened by the sun in the open air in Gower Street, and fine celery was grown in Upper Gower Street. Regent Street was planned in 1812, Belgravia was built about 1825, and New Oxford Street in 1847. With these exceptions, little alteration was made in London thoroughfares until after the holding of the Great Exhibition of 1851. Since then the City has been almost entirely rebuilt, new districts have been built upon, and the outlying villages have been united to London so as to form an immense and ever-increasing town.

London grew for many centuries along the side of the river, which formed a means of communication from point to point, and supplied the inhabitants with water. At the end of the 18th century the north of London began to be built upon, and the building over the clayey soil to the north of the New Road was largely connected with the increase in the number of the water companies. As an instance of the late growth in this connection, it may be mentioned that a gentleman now living remembers, as a boy, visiting at his uncle's country house in Hoxton. It was then the custom for the travellers to wait in Finsbury Square till a sufficient number of persons were collected, when they were conducted across the dangerous ground between that place and Hoxton by the horse patrol. By this growth away from the river, and the building up of wharves, etc., by the river-side, London lost much of its natural beauty, and the Thames did not recover its proper position as the central feature of the town until the building of the noble embankments, the total cost of which was over £3,000,000. The Victoria Embankment on the north side of the river (from Westminster to Blackfriars Bridge) was constructed 1864-70, the Albert Embankment (from Westminster Bridge to Vauxhall) on the south side, 1865-68, and Chelsea Embankment, 1871-74.

Water Supply. During the early centuries of its history London was supplied with water from numerous wells, some of which have left their mark in the names of places, from the Thames, and from

many streams that fell into the river; but in the 13th, 14th, and 15th centuries water was brought into the City by pipes to several large conduits, and from these the inhabitants were supplied by water-carriers. As early as the 13th century the exhalations from the Fleet river had become offensive, and in 1307 the river was inaccessible to ships on account of the accumulation of filth.

In 1522 Peter Morris obtained a grant to enable him to supply Thames water to houses at the east end of the City, and for this purpose he erected a "forcier" on an arch of London Bridge. The works were afterwards greatly enlarged, and in 1701 were sold to a company which continued the supply until 1822, when the Southwark Company purchased their rights. The New River Company commenced operations early in the 17th century, and by 1720 London was so well supplied that Strype wrote at that date:—"There is not a street in London but water runs through it in pipes conveyed underground, and from these pipes there is scarce a house whose rent is £15 or £20 per annum but has the convenience of water brought into it." Smaller houses were supplied from a cock or pump situated in the street near by. The dates of the formation of the water companies which subsequently came into existence are as follows:—Chelsea 1721, Lambeth 1783, Vauxhall 1805, West Middlesex 1806, East London 1806, Kent 1810, Grand Junction 1811, and Southwark 1822. The need of a further supply has been long felt, and many proposals have been made; and in 1902 a Bill was passed establishing a Metropolitan Water Board, which purchased and now controls all the supply.

Sanitation. Very little knowledge of sanitary needs was general until late years, and old London before the fire must have been a peculiarly unhealthy place. In 1848 the Metropolitan Commission of Sewers was created by Act of Parliament. Complaints of the condition of the Thames by reason of the emptying into it of the sewage of a great city became so general that the Metropolis Local Management Act was passed in 1855 to provide for the creation of the Metropolitan Board of Works, which was entrusted with the construction of works for preventing "all or any part of the sewage within the metropolis from flowing or passing into the River Thames in or near the metropolis." The main drainage scheme was carried out between 1859 and 1863 at a cost of £4,607,000. In 1888 the Local Government Act already referred to was passed. Shortly afterwards the notification of disease was made compulsory, and in 1891 the Public Health London Act was passed, consolidating previous sanitary enactments and making certain important new departures in Public Health Law. Since 1891 a greatly increased amount of attention has been devoted to sanitary administration. The operation of the amended Housing of the Working Classes Act, Building Act, and Factory and Workshops Acts of recent years has brought about considerable improvements in London.

Lighting. Until nearly the middle of the 18th century the duty of illuminating the streets on dark nights was left entirely to the citizens themselves,

with the result that those who went out at night were forced to provide themselves with lanterns. In 1736 the Corporation obtained permission from Parliament to levy a rate for the purpose of erecting oil lamps. Winsor's patent gas was exhibited in June, 1807, in Pall Mall, but Finsbury Square was the first public place in London in which gas-lighting was actually adopted, and Grosvenor Square the last. Several gas companies were formed, but it was many years before oil lamps were entirely superseded. Great improvements have been made in gas lamps, but the electric light has come largely into use for street lighting and in the illumination of large buildings. St. Pancras was the first parish to adopt generally the electric light.

Docks. There were formerly various wharves and quays in the port of London, which were set aside for the accommodation of merchants of all nations and as landing-places for their goods and merchandise; but as the city grew these were found to be quite inadequate for the work required of them, and at the beginning of the 19th century several dock companies were formed. West India docks at the Isle of Dogs were opened in 1802, London docks at Wapping in 1805, East India docks at Blackwall in 1806, St. Katherine's docks, on the site of St. Katherine's Hospital, in 1828, Victoria docks in 1850, and Millwall docks at the Isle of Dogs in 1868. The Albert extension of the Victoria docks was opened in 1880, and the latest is the Tilbury dock. All these are on the north side of the river. The Commercial docks, reconstructed 1807, and the Surrey docks (1812) are on the south side; the former are much the oldest of the docks of London, dating back to the seventeenth century. In 1908 Parliament established a Port Authority, which has taken over all the docks, and has superseded the Thames Conservancy so far as the tidal Thames is concerned.

Bridges. It is not known when the first bridge was built, but there is every reason to believe that one existed in Roman times. Until 1769, when Blackfriars Bridge was built, London Bridge was the only one over the Thames connecting the north and south of London. Most of the older bridges have been rebuilt—London Bridge in 1831, Blackfriars Bridge in 1869, Westminster Bridge in 1854-62; Waterloo Bridge built 1811-17, and Southwark Bridge in 1815-19, still remain. Several new bridges have been built farther up the river, and others have been rebuilt. The Tower Bridge, so constructed as to allow of large vessels passing under it, is the most important addition to the bridges of London of late years; and, after having been in progress for a considerable period, it was completed in 1893.

Markets. Markets were originally held in the open streets, and such names as Cheapside, East Cheap, Poultry, and Bread Street, point to the places where early markets were held. Leadenhall, Billingsgate, and Smithfield markets are of considerable antiquity; the first two still exist, but the last (Cattle Market) has been removed to Islington. It has been superseded at Smithfield by the Central London Meat Market, which was opened in 1868.

Several other markets have been added to this by the Corporation, which also carries on the Foreign Cattle Market at Deptford. In the western portion of the town Hungerford Market, founded in 1680, came to an end in 1860, and its site is now occupied by Charing Cross station. Covent Garden market for vegetables, fruit, and flowers, still holds its own. The ill success of Columbia Market, founded in the East End by the late Baroness Burdett-Coutts, shows how difficult it is to establish a new centre of trade.

Architecture. The streets of London contain some good specimens of architecture; but, owing to the want of local regulations, the effect of a fine building is often spoilt by its surroundings, as in the view from Charing Cross bridge over the Victoria Embankment, with the beautiful dome of St. Paul's in the distance. This is still one of the finest views in London, in spite of the disproportionate size of the hotel buildings in the foreground. Very handsome structures have been erected in parts of the City, but in several instances these are too high for the width of the streets in which they are situated. The finest streets in the West End are Pall Mall and Piccadilly, which consist, to a great extent, of palaces for the chief clubs.

The Houses of Parliament (1840-1867), which cost about £3,000,000, form the grandest pile of secular buildings in London. Of modern London buildings, the second in importance is that designed by the late G. E. Street, R.A.—the Law Courts in the Strand. The royal palaces cannot be praised for architectural effect. Buckingham Palace is beneath contempt, and St. James's Palace, although interesting from its associations, is mean in appearance. Wren's noble cathedral, which replaced the old cathedral of St. Paul's, forms the finest object in most views of London. In the dome and gilded statue of Justice above the new Sessions House, in the Old Bailey, on the site of Newgate Gaol, the City now possesses another landmark. Many of the churches of the City designed by Wren add a special feature of interest to the view on account of the beauty of the steeples; but unfortunately many have been ruthlessly destroyed, and others are threatened with destruction.

St. Thomas's Hospital on the Albert Embankment has a very distinguished position, and balances the Houses of Parliament on the other side of the river, but it is not deserving of much praise as a beautiful building.

Great sums of money have been spent upon the Government offices in Whitehall, but, on the whole, Somerset House, on the Victoria Embankment, may be considered as the most satisfactory Government building in London, although the Bank of England and the Royal Exchange have special merits.

Relics. In a city of such great antiquity as London one might expect a large number of relics of the past, but the Great Fire of 1666 destroyed much, and during the last fifty years more still has passed away. The relic of greatest antiquity is the London Stone, now fixed on the front of St. Swithin's Church, Cannon Street. It has been generally supposed to be a Roman *milliarium*, but

some have claimed for it a still greater antiquity, and it has always been treated with superstitious reverence as having been connected with the history of the City. The history of the Tower takes us back to the time of the Norman Conquest, and of churches of special interest may be mentioned Westminster Abbey, one of the grandest ecclesiastical buildings in the country. St. Bartholomew's, Smithfield, St. Helen's, Bishopsgate, Southwark Cathedral, and the Temple Church are all of great interest, and Lambeth Palace must not be forgotten in any list of the relics of the past.

Hospitals. St. Bartholomew's, St. Thomas's, and Guy's Hospitals are establishments of great interest and importance, and hospitals of a later date are to be found in all parts of the town. Great advance has been made in recent years in the provision of hospitals for the isolation of certain kinds of infectious disease. Moreover, much has been done, particularly in the last few years, by the erection of additional asylums and in other ways, in the direction of improving the provision made for the treatment of the insane.

Colleges and Schools. The University of London (q.v.)—reconstituted in 1898 as a teaching university—was instituted in 1836, and removed in 1869 to Burlington Gardens; it is now installed in the Imperial Institute Buildings, South Kensington. University College, Gower Street, was founded in 1828. King's College, Strand, was built in the year 1828. St. Paul's School occupied a prominent position in St. Paul's Churchyard from its establishment by Dean Colet in 1512 until it was removed to West Kensington. St. Peter's College, Westminster, is quartered in the dormitory of the old monks of Westminster Abbey. Christ's Hospital (Blue Coat School), once in Newgate Street, has been removed to Horsham. Charterhouse School has been removed to Godalming. Merchant Taylors' School, which was situated in Suffolk Lane, was removed to the Charterhouse in 1875. The City of London School, first situated in Milk Street, Cheapside, was removed to a handsome building on the Victoria Embankment in 1883. The growth of the public elementary school system has steadily progressed since 1871, when School Boards were established, and has been attended with most far-reaching results as regards the elementary education of London children. The number of children on the roll in 1908 was about 750,000. In 1903 an Act was passed by which the London School Board was abolished and elementary, and also secondary education placed under the control of the County Council.

Museums and Picture Galleries. The British Museum, which originated in the purchase by Parliament in 1753 of the collections of Sir Hans Sloane, and has been enormously added to since then, is now one of the most remarkable collections to be found in Europe, and the library is widely renowned. The Natural History collections have been removed to a new and handsome building in Cromwell Road, South Kensington. The Victoria and Albert Museum was originated by Sir Henry Cole as the South Kensington Museum. New buildings for it were opened in 1909. The Wallace

Collection, left to the nation by the late Lady Wallace in 1897, is located in Hertford House.

The National Gallery, founded in 1824, has grown into one of the first of European collections of pictures, and these pictures are well housed in handsome galleries. The National Portrait Gallery was permanently housed at the back of the National Gallery in 1896. The Tate Gallery (at Millbank) was opened in 1897, and has since been enlarged.

Parks and Open Spaces. St. James's Park (80 acres) was formed by Henry VIII., and improved by Charles II. Green Park (70 acres) forms a part of St. James's although separated from it by iron railings. Hyde Park (390 acres) existed for many years as a portion of the Manor of Hyde, and it became the most fashionable resort after the Restoration. Kensington Gardens (360 acres), once attached to the Palace, is now virtually part of Hyde Park. Regent's Park (470 acres) was formed out of Marylebone Park, and was named after George IV. when regent. The chief parks formed in the 19th century are:—Victoria Park (300 acres), 1842, enlarged in 1872; Battersea Park (180 acres), 1852–58; Finsbury Park (115 acres); and Southwark Park (63 acres), which is not in Southwark but at Rotherhithe. Greenwich Park, Hampstead Heath and various commons may be added to this notice of open spaces, as also those of the London County Council.

Conveyances. The Thames afforded for many centuries almost the only means of communication between different parts of London, but early in the seventeenth century hackney coaches were introduced in the streets. Omnibuses were brought out in 1829, but they did not become common until many years after this date. The horse-bus is rapidly being superseded by the motor-bus, and the horse-cab by the taxicab. The control of the now extensive tramways is passing more and more largely into the hands of the London County Council. The Electric Tube System, started in recent years, shows signs of great development, and several lines have been opened since the beginning of the 20th century. The old underground lines have been electrified.

2. A city and port of Ontario, Canada, midway between Lakes Erie and Huron, at the junction of the two branches of the Thames, 116 miles S.W. of Toronto, the capital of Middlesex. It is well built, with regular streets and fine public buildings. It is a great railway centre, and being in a rich district enjoys a prosperous trade. The chief industry is the refining of petroleum. There are also foundries, mills, tanneries, and factories of different kinds. In the neighbourhood are sulphur springs. The town returns one member to Parliament, and one member to the Provincial Legislature.

London, UNIVERSITY OF. The idea of a London University is much older than any institution bearing the name. Professorships of divinity, music, rhetoric, astronomy, geometry, law, and physic, for the benefit of residents in London, were established by Sir Thomas Gresham in 1548; but no further steps were taken in this direction till

1827, when, through the efforts of the poet Campbell and others, the society called University College came into existence, and sufficient capital was subscribed to erect buildings in Gower Street. It was founded on a non-sectarian basis, and, though merely a teaching body, looked forward to a charter of incorporation, which should give it the power of conferring degrees; it therefore styled itself the "London University." The failure of a bill for admitting Dissenters to the old universities added force to this demand; but, whilst incorporating University College, in 1835, the Government thought it more prudent to institute a separate body for the purpose of examining for degrees (1836). University College and King's College (incorporated 1829) were at once affiliated to the new foundation, which was governed by a Senate comprising a Chancellor, Vice-Chancellor, and thirty-six fellows. Other colleges were affiliated in 1850, and candidates for degrees were required to show that they had received instruction at one of these during two years; but, as the Senate had no control over the affiliated colleges, the system was found unsatisfactory. It was abolished by the charter of 1858; but for medical degrees attendance and clinical practice at a recognised medical school remained a necessary qualification. At the same time the graduates were constituted members of the governing body under the title "Convocation." In 1863 another charter was granted, almost identical with that of 1858. The University was not attached to any one spot prior to 1870, when the building in Burlington Gardens was erected. Under an Act of Parliament passed in 1898, the University has been reconstituted as a teaching as well as an examining body, and in 1900 it was installed in the Imperial Institute buildings at South Kensington. Women are now on an equal footing with men. Degrees are conferred in Arts, Science, Laws, Music, and Medicine. Since 1859 the study of English Philology and Literature has formed a special feature of the Arts course. The Science faculty was instituted in 1860, and the faculty of Music in 1877. More recently the University has established a separate faculty for engineering and another for economics and political science (including commerce and industry). There is now an Academic department, which organises and controls higher education in the various London "schools" and other institutions which are affiliated with the University, and an External department, which carries on the old work of the University in holding examinations for and conferring degrees upon External students. The teaching work of the University is carried on in three different ways: (1) by the University itself, (2) by the "schools" affiliated with it, (3) by other institutions at which there are "recognised" teachers. The University's own teaching work is that done at University College, which is now an integral part of the University, and of which the students rank as "internal" students. The University has its own laboratory in the Imperial Institute Buildings at South Kensington, and to it has been transferred the extensive College of the Worshipful Company

of Goldsmiths at New Cross. The examiners are selected annually by the Senate. Examinations may be held at any provincial centre, whether city, institution, or college, which expresses a desire to that effect. These examinations are conducted by the Senate, and take place simultaneously with those in London. Examinations are also held in the Colonies. The work of conducting courses of educative lectures in various parts of the suburbs of London by the London University Extension Society is now wholly carried on by the University.

London Clay, the chief member of the Lower Eocene (q.v.), is a great marine clay, blue where not in contact with air, but turned to brown for some distance from the surface. It contains layers of septarian nodules, which are collected at Harwich and Sheppey for the manufacture of Roman cement. The clay is about 500 feet thick in the London Basin, and extends from Hungerford (Berks) to Suffolk and the Isle of Thanet, covering most of Hertfordshire, Middlesex, and Essex. In the Hampshire Basin the thinner Bognor clay, and in France the Argile de Dunkerque, are of the same age. The London Clay seems to have been deposited in a bay with a tropical climate, and water about 100 fathoms deep. Numerous fossil fruits, including those of *Nipadites*, allied to *Nipa*, a palm whose fruits now float down the Ganges, custard-apples, acacias, and Proteaceæ, have been found in this clay at Sheppey, together with crabs such as *Xanthopsis*; many gastropods, including large cowries (*Cypræa*), cones, volutes, *Fusus* and *Pleurotoma*; *Belosepia* and six species of *Nautilus* among cephalopods; *Cryptodon* (*Axiurus*) *angulatum*, and other bivalves; rays such as *Myliobates*, sharks, a sword-fish 8 feet long, and a saw-fish 10 feet long; crocodiles, numerous turtles, and sea-snakes (*Palæophis*), the earliest known ophidians; birds, including the notched-billed *Odontopteryx*; and an opossum and the pachyderms *Coryphodon* and *Hyracotherium*. These fossils suggest a comparison between the London area in Lower Eocene time and the shores of the Bay and Sea of Bengal at the present day.

Londonderry. 1. A maritime county of North Ireland, in the province of Ulster, on the North Atlantic, having Antrim on the E., Donegal on the W., Tyrone and Lough Neagh on the S. and S.W. It is 50 miles long by 40 wide, and contains 816 square miles, and has a coast-line of 30 miles, in parts lofty and rugged, in others low. The surface consists of river valleys, separated by tablelands, and rises in the S. to a height of 2,000 feet. Among the rivers are the Bann from Lough Neagh, which divides Londonderry from Antrim on the E., the Foyle in the W., and the Roe. About 37 per cent. of the surface is grass, and the chief productions of the arable portion are oats, potatoes, turnips, and flax. Linen is the staple manufacture, and the fisheries are valuable. Lead and copper also are found. Belonging originally to the O'Neils, the district was in the 17th century made over chiefly to London Companies, and managed by the Irish Society. The county

returns two members to Parliament. The chief towns are Londonderry, Coleraine, and Limavady. Pop. (1901), 144,329.

2. Londonderry, the capital of the county of the same name, is on a height, situated 3 miles from the mouth of the Foyle, 162 miles N.W. of Dublin, and 95 miles N.W. of Belfast. The town, which in great measure belongs to the London Companies, has a good harbour, and forms a place of call to some of the American liners, and has a good import, export, and coasting trade. The chief industries are the manufacture of shirts and under-clothing, ship-building, distilling, and iron-founding. There is good salmon-fishing on the Foyle and in the lough. The city—the greater part of which is now outside the ancient walls—has a central square with four main streets diverging, and an iron bridge of 1,200 feet leads to the suburb Waterside on the right bank of the Foyle. Among the chief buildings are the Protestant cathedral, the Roman Catholic cathedral, the courthouse, and guildhall. Londonderry is noted for its siege in 1689, and a column commemorates the Rev. G. Walker, its defender. Pop. (1901), 13,800.

Long, GEORGE (1800–79), an English classical scholar, was born at Poulton, Lancashire, and educated at Trinity College, Cambridge, where, in 1821, he was bracketed with Macaulay for the Craven, and in 1822 was wrangler and senior medallist, becoming fellow of his college in 1823. In 1824 he filled a post in Virginia as lecturer in Ancient Languages, and in 1828 became professor of Greek in London University. From 1842–46 he was professor of Latin at University College, London, and from 1846–49 Reader in Law at the Temple. While in London he had much to do with advancing the Royal Geographical Society. From 1848–71 he was Classical Lecturer at Brighton College, where he was much esteemed. He edited the *Journal of Education*, *Penny Cyclopædia*, *Biographical Dictionary*, *Bibliotheca Classica* series, and contributed to other works, and issued versions and editions of classical authors. He also wrote *The Decline of the Roman Republic*, 5 vols.

Long-billed Birds of Paradise (*Epi-machinæ*), a sub-family of Paradiscidæ, with four genera, characterised by their long, slender bills, and the plumage of the wings and tails highly developed.

Longchamp, WILLIAM DE, a 12th century Norman statesman, and favourite of Richard I., who made him Bishop of Ely, and joint justiciar of England. He hated the English, and was hated by them, and his arrogance and oppression caused him to be sent into retirement to Normandy. But he was active in procuring the ransom of Richard, who in gratitude made him Chancellor, but he was again overthrown by the influence of the Princes John and Geoffrey, and died in 1197.

Longevity. The duration of life in different animals varies between very wide limits. Some insects live in their perfect form for a few hours only; while the elephant, eagle, carp, and other creatures attain, in some instances, an age considerably

exceeding 100 years. For each species it appears that a limit of age, which is rarely exceeded, can be fixed; and when the individual member of the species lives for a longer period than that indicated it is said to present an instance of longevity. In man, the limit of the duration of life can be determined with some degree of exactness, at any rate so far as those countries are concerned in which an attempt to accurately register all deaths is made. English statistics show that considerably less than one-tenth of those born attain to the age of 80, while of 100,000 born less than 20 reach the age of 100. Careful inquiry has been made in recent years into the subject of centenarians, and it has been shown that those instances in which human life has been stated to considerably exceed the 100 year limit, are not well authenticated. A German man of science, Weismann, has recently discussed the question of the duration of life in its relation to the theory of Darwin. He maintains that the average length of life in each species is determined by the process of natural selection, and that the average duration of existence in the individual is largely determined by the length of time required by it to produce and rear its offspring to maturity.

Longfellow, HENRY WADSWORTH (1807–82), an American poet, whose name is a household word on both sides of the Atlantic. He was born at Portland, in Maine, and was educated at Bowdoin College, where he had Nathaniel Hawthorne for classmate. He distinguished himself in ancient and modern languages and translations, and in 1826 he went to France, Spain, Italy, and Germany with a view to a professorship of Foreign Languages and Literature. The fruits of this trip are embodied in *Outre Mer*, as were the fruits of a later one in *Hyperion*, two prose works which some people esteem almost as much as his poetry. In 1836 he was appointed professor of Modern Languages and Literature at Harvard. In 1839 appeared his first book of verse, entitled *Voices of the Night*, and from that time the productions of his pen flowed steadily forth. Among his longer works *Evangeline*, *The Building of the Ship*, *Hiawatha*, *The Golden Legend*, *The Spanish Student*, *The Courtship of Miles Standish*, and the *Tales of a Wayside Inn*, are widely read and admired; while of his short poems, *The Wreck of the "Hesperus"*, *The Village Blacksmith*, *The Slave's Dream*, *The Sands of Life*, *The Belfry of Bruges*, *The Children's Hour*, and many others are universal favourites. He was also singularly successful in his translations from the Norse and German.

Longford, an inland county of the province of Leinster, Ireland, to the east of Lough Ree and the upper Shannon, having a length of 29 miles, a width of 20 miles, and containing 421 square miles. The surface is generally level, with low hills, interspersed with bogs, and is fertile. About one-half is grass land, and the arable portion produces oats and potatoes. There are several small lakes, and the chief rivers are the Camlin and Tuny, while the Royal Canal also passes through. There is some marble-quarrying; but the chief industries

are the manufacture of linen and coarse woollens, and the making of butter. On the islands of Lough Ree are some interesting remains of monasteries. The county returns two members to Parliament. Pop. (1901), 46,581. Longford, the county town, is 76 miles N.W. of Dublin.

Longicornia, the division of beetles including those in which the antennæ, or "horns," are long, simple, and rod-like in form. The best-known English species is the "Musk Beetle" (*Aromia moschata*), which has a strong musk-like odour.

Longinus, DIONYSIUS CASSIUS (circa 213-73), philosopher and rhetorician, studied under Ammonius at Alexandria, and taught at Athens. He settled at Palmyra, and became chief counsellor of Zenobia, whom he encouraged to resist Rome. He was consequently beheaded by Aurelian. His views were modelled upon Plato, and a work *On the Sublime* exists, with which he is commonly, though probably erroneously, credited.

Long Island, forming three counties of the state of New York, U.S.A., is bounded on the N. by Long Island Sound, on the S. and E. by the Atlantic, and on the W. by East River, crossed by Brooklyn Suspension Bridge. The island is 115 miles long, with a breadth varying from 12 to 24 miles, and contains 1,682 square miles. The interior rises in a line of low hills, and on the S. shore is a series of lagoons, while much of the surface is forest and waste. There are lakes and watercourses, and market-gardening is largely carried on. Game and fish are plentiful, and the oyster-beds are renowned. The famous Blue Points come from here. The chief towns are Brooklyn, Long Island City, and Flushing, and the island is well provided with railways. Other places of note are Coney Island—a celebrated watering-place—and the Creedmoor Rifle Range.

Longitude, in astronomy. [LATITUDE.]

Long Parliament, the name usually given to the Parliament which met on November 3, 1640. Its members were unanimous in their determination to rid the country from the "thorough" policy of Strafford and Laud, who were impeached—Strafford's impeachment being afterwards converted into an attainder—and put to death. An attempt to save Strafford by means of the army was followed by an Act by which it became impossible to dissolve the Parliament without its own consent. The Star Chamber and Court of High Commission were abolished, and an Act was passed making it illegal to raise taxes without consent of Parliament. In consequence of the ascendancy of the Presbyterian element the Parliament was "purged" by Colonel Pride, who surrounded the House with two regiments, and ejected ninety-six members (December 6 and 7, 1648). The members who were left, henceforward known as the "Rump," were expelled by Cromwell on April 20, 1653. They were recalled after the overthrow of Richard Cromwell (May, 1659), but were again expelled by Lambert in the following October. The Rump was restored a second time by Monk, who reinstated all the members previously excluded

(February 21, 1660). It was now determined to summon a new Parliament, and the Long Parliament dissolved itself on March 16, 1660.

Longsword, WILLIAM (1196-1226), the natural son of Henry II. by "Fair Rosamund;" he was made Earl of Salisbury, and distinguished himself in the Crusades. His son, WILLIAM (died 1250), was deprived of his earldom by Henry III., and was slain in the Crusades.

Loo (originally *lanterloo*, a word of Dutch origin), a round game of cards. Each player places in the pool a certain number of coins or counters (either three or some multiple of three), which are termed his "loo." The dealer, whose stake is double that of the others, deals three cards to each player and an additional hand called "miss." The card which remains at the top is turned up as trump, and the cards rank in all respects exactly as in whist. The player on the dealer's left then examines his cards and determines whether he will "declare," "withdraw," or "take miss." A player who declares and loses the trick is "looted"—i.e. he pays into the pool a fine equal in amount to the stake.

Loochow Islands are a group of thirty-seven isles, extending from Kynshu, in Japan, almost to Formosa; and containing 1,863 square miles. The chief islands of the group are Oshima and Okinawa, the former of which has a good harbour. China lays claim to the islands, though the inhabitants in general characteristics are of Japanese type, with some peculiar customs of their own. The products of the islands are sugar, sago palm, oranges, and a small breed of ponies, and the staple food of the natives, pork, fish, and sweet potatoes.

Lophobranchii. [BONY FISHES.]

Lophopsittacus, a name proposed for an extinct group of parrots, of which *L. mauritianus* may be taken as the type. They had a frontal crest rising from the base of the beak.

Lophopus, the "Bell Flower Animal," was first described more than a hundred and fifty years ago. It belongs to the Polyzoa, a class of small animals which usually live in large colonies, each individual protruding its crown of tentacles through a separate aperture, and withdrawing it instantly on the least alarm. The common "Sea-mat" (*Flustra*), usually taken for sea-weed, is the dried skeleton of a colony of Polyzoa.

Lord (Anglo-Saxon *hlaford*, "guardian of the loaf," i.e. "master of the house," a word probably of poetical origin) is a title now strictly applicable only to peers of the realm (including the Lords spiritual, or archbishops and bishops who have seats in the House of Lords) and to the holders of certain public offices, such as the Lord Chancellor, Lord-Lieutenant of Ireland, etc. It is also prefixed to the courtesy titles of the eldest sons of dukes, marquises, and earls, and to the Christian name and surname of the younger sons of dukes and marquises.

Lord High Admiral, the highest combined administrative and judicial officer in the British

Navy. His duties have occasionally, and now for more than half a century, been divided among the Commissioners of the Board of Admiralty, but there is nothing to prevent a Lord High Admiral being again appointed. The Duke of Clarence, afterwards William IV. (1827-28), was the last Lord High Admiral.

Lord-Lieutenant. A Lord-Lieutenant in England is an officer of great distinction appointed by the Crown for managing the standing militia of the county and all military matters therein. The office is supposed to have originated in the reign of Henry VIII., for Lord-Lieutenants are mentioned as known officers, though they had not been long in use. Camden speaks of them in the time of Queen Elizabeth as extraordinary magistrates, constituted only in times of difficulty and danger. They are generally of the chief nobility and of the best and most esteemed interest in the county, and they were to form the militia in case of a rebellion, etc., and march at the head of them as the Crown should direct. They have the power of presenting to the sovereign the names of deputy-lieutenants, who are to be selected from the best gentry in the county, and act in the absence of the Lord-Lieutenant. Their jurisdiction and privileges in relation to the militia, yeomanry, and volunteers reverted to the sovereign by statute 34 and 35 Vict., c. 86. Subservient to the Lord-Lieutenant and the deputy-lieutenants are the justices of the peace. The appointment of county magistrates has been usually made by the Lord Chancellor on the recommendation of the Lords-Lieutenant. This practice has been the subject of discussion in Parliament, and objection having been taken to this almost invariable practice it is quite likely that some modification in such appointments will eventually take place. The Lord-Lieutenant of Ireland is the representative of the King in that country, and is invested with special rights and privileges in that capacity.

Lord of the Isles, a title borne by certain chieftains in years gone by of the Western Isles of Scotland. The title—though not assumed till later—seems to have had its origin in the gift of Arran and Bute by David I., in 1135, to the Lord of Argyll. He was killed by Malcolm IV., in 1164, and his sons held the southern isles, nominally under the Scottish Crown. It was John, son of Angus of Isla, who first assumed the title. After intrigues and reverses of various kinds the line came to an end in the person of John, fourth and last lord, who was deprived by James IV., in 1493, and in 1540 the title was annexed to the Crown of Scotland.

Lord's Supper, the name given in the Book of Common Prayer to the Sacrament which is also called Holy Communion, Eucharist, or Liturgy. In the primitive Church it seems to have been celebrated either daily or weekly in connection with the Agapæ (q.v.), but before their abolition the Communion Service had become entirely distinct from them. At an early period the ordinances of the Church required its members to receive the Sacrament at the great yearly festival,

and it was also usual to partake of it on all occasions of more than ordinary solemnity. The practice has been maintained by all Christian bodies up to the present time, with the single exception of the Society of Friends; but from an early date widely divergent views have existed as to the exact meaning of the rite and the manner in which it should be administered. The source of the controversy regarding the "real presence" may be placed at least as far back as the 3rd century, when Origen maintained that the bread and wine are merely symbols, in opposition to the mystical view which then prevailed throughout the Church. Neither view, however, was distinctly formulated until the 9th century, when Paschasius Radbertus put forward the doctrine that by a miraculous process attending the consecration the substance (q.v.) of the bread and wine is transformed into that of the very body and blood of Christ. This doctrine received official sanction at the Council of Rome (1079), and is taught by the Roman Catholic Church at the present time. [TRANSUBSTANTIATION.] The reformers of the 16th century regarded this view as superstitious, but they differed widely amongst themselves. Luther, putting a literal interpretation on the words "This is My body," maintains that the body and blood are supernaturally present in the bread and wine, although not identical with them (consubstantiation). Zwinglius, on the other hand, declared that the words "this is" are equivalent to "this represents," so that the Sacrament is merely an act of commemoration, and the elements have only a symbolic significance. Calvin took up a position midway between the two, asserting that although the body and blood are not actually present in the elements, yet the faithful partaker is, in the act of receiving them, brought into union with Christ, through the inspiration of the Holy Ghost. This is the view now held by most Protestant Churches. The 28th Article of the Church of England asserts that "the body of Christ is given, taken, and eaten in the supper only after an heavenly and spiritual manner." The forms observed in the celebration of the rite, which vary greatly in different Churches, mostly have a doctrinal origin. Thus, the denial of the cup to the laity in the Roman Catholic Church is grounded on the belief that the bread as well as the wine is converted into the blood of Christ; and the elevation of the Host (q.v.) is intended not only to represent the exaltation of Christ after His death, but to display His body and blood as objects of worship to the congregation. [LITURGY, MASS.]

Lorelei, or LURLEI, a precipitous rock near St. Goar, on the Rhine, 427 feet in height. The legend, well-known from Heine's song, which makes it the abode of a siren who has lured many boatmen to their fate, is said to have been invented by Clemens Brentano.

Loretto, a town of Italy, 3 miles from the Adriatic, and 15 miles S. of Ancona, on the right bank of the Musone, is chiefly noted as containing the Holy House of Nazareth, which tradition states to have been miraculously moved, first to

Dalmatia, and then in 1295 to Loretto. The church of Santa Casa is in the centre of the town, and before it is a statue of Sixtus V., who made the town. The Casa itself is cased in marble, beautifully sculptured, and contains an image of the Virgin, said to be by St. Luke.

L'Orient, or **LOBIENT** a port of France, on a bay in the department of Morbihan, 116 miles N.W. of Nantes. The port, which is well built and has a large deep harbour, was founded by the East India Company in 1664, and, coming eventually to the Government, has been since 1815 the chief ship-building port of France. It has dockyard and arsenal, schools of navigation and marine artillery, an observatory, and is fortified. There are also foundries, fitting-shops, rope-works, cooperages, and sailmaking establishments, and some exportation of sardines. The roadstead is formed by the estuary of the Blavet.

Loris (= *Stenops* = *Nycticebus*), an East Indian genus of Lemurs, with two or three species, none much larger than a squirrel. The head is round, with a pointed snout, and large eyes. The fur is soft and thick, and usually brown in colour. They are nocturnal in habit, slow in movement, whence they are sometimes called Slow Lemurs, and feed on insects and small birds.

Lorraine, since 1871 a district between Metz and the Vosges, but in the Middle Ages a much more extensive region. As forming part of the German Empire in the 9th century, it comprised the land between the Scheldt, the Meuse, and the Rhine. In the next century its Count became a Duke, and in 954 it was divided into Upper and Lower, the latter of which became part of Brabant in the 13th century. Upper Lorraine retained its Dukes till 1736, when it passed to Stanislas, ex-King of Poland, becoming French in 1766. [ALSACE, GERMANY.]

Lory, any of the brush-tongued parrots from the Australian region. The general coloration is red and blue, though forms with green, brown, and black plumage occur. The extensile tongue serves to extract nectar and pollen from flowers.

Los Angeles, a town, capital of a county of the same name in South California, on the South Pacific Railway, lying between the Sierra Madre and the Pacific, 17 miles from the coast, and on the bank of a stream. It was a flourishing town in the 18th century, and from 1835-46 capital of California, but was taken in the latter year by the United States. It is chiefly renowned for its wine grapes, and fruit, especially oranges, and has two immense reservoirs for irrigation purposes. It is also a resort for invalids.

Lost Property. The law of finding lost property; after numerous contradictory decisions, has been determined by the Court of Criminal Appeal in the following way:—1. If a man find goods that have been actually lost, or are reasonably supposed by him to have been lost, and appropriates them with intent to take the entire property of them, really believing, when he takes

them, that the owner cannot be found, it is not theft. 2. But if he takes them with the like intent, though lost, or reasonably supposed to be lost, but reasonably supposing that the owner can be found, it is larceny. In the case on which the foregoing decision was come to the prisoner had found a bank-note, but had no means of knowing who was the owner. Afterwards he was informed who the owner was; but, notwithstanding this, he changed it and applied the money to his own use. He was held not to be guilty of larceny because when he found it he did not know that the owner could be found. This law applies to parcels, packets, or other chattel property, left by oversight or negligence in the possession of a stranger. They can be appropriated by the finder or possessor only in the entire absence of any likelihood or natural possibility of the real owner appearing or being found.

Lot, a department of southern France, part of the old province of Guienne, contains 2,012 square miles, divided into 3 arrondissements. The Dordogne and the Lot are its rivers. The plateau of the Cevennes in the E. slopes to the S.W., and the valleys are fertile. The chief productions are phosphate of lime, wheat, maize, tobacco, fruits, chestnuts, and especially wine, truffles, leather, wool. There is a good deal of sheep-breeding, and milling, tanning, and woollen manufacture are carried on. The river Lot, a tributary of the Garonne, rises in Mont Lozère, and flows W. to join the Garonne after a course of 300 miles.

Lot et Garonne, a province of south-west France, part of old Guienne and Gascony, contains 4 arrondissements, drained by the Garonne and its tributaries the Gers and the Lot, and is 62 miles long, with an area of 2,067 square miles. It is mostly fertile plain, except in the S.W., where it joins the Landes, and its chief productions are wheat, maize, colza, tobacco, wine, hemp, and plums, and timber. Poultry-rearing is largely carried on, and among the industries are metal-working, paper, woollen, and cork manufacture, distilling, and tanning.

Lothian, the tract of land lying between the Tweed and the Firth of Forth. From 547 to 1018 it belonged to Northumbria. It is now divided into East (Haddington), Mid (Edinburgh), and West (Linlithgow) Lothian. From it the Kers take their titles of Marquis and Earl of Lothian.

Lotion, a solution used for washing over or applying on lint to the external surface of the body; the mercurial lotions of the British Pharmacopœia are examples of this form of preparation.

Lotteries, any schemes for the distribution of prizes by chance, or for raising money by the sale of chances to share in a distribution of prizes; lotteries were declared illegal in England in 1826.

Lotus, a name applied generically by modern botanists to the birdsfoot trefoils, a group of Leguminosæ. The sacred Lotus of the East is *Nelumbium speciosum*, which belongs to the water-lily family. From its fleshy rhizome spring the tall peltate leaves and long-stalked flowers, both of which may

in early stages float on the water. The leaves are covered with fine hairs, so that the water rolls off them, and their stomates are confined to the centre of the upper surface. The numerous petals are either pure white or, more commonly, pink-tinted, and the enlarged funnel-shaped receptacle, in the upper surface of which the carpels are separately sunk, is most characteristic. It was aptly compared by Herodotus to a wasp's nest; but, though found from Australia and Japan to the Caspian, it no longer grows in Egypt, where he, Strabo, and Theophrastus mention it as occurring, and where ancient sculptures clearly attest its connection with the worship of Isis. It is still venerated by Buddhists. Both the rhizome and the seeds are edible. The present white and blue lotuses of the Nile are two species of water-lily, *Castalia Lotus* and *C. cœrulea*. In a 12th-century manuscript of Dioscorides, whilst *Nelumbium* is represented under the name *kyamos*, the lotus, the food of the Lotophagi of Homer, appears as the fruit of *Celtis australis*, the nettle-tree of the Mediterranean region, a member of the elm tribe which bears a small, sweet, drupaceous fruit.

Lotze, RUDOLF HERMANN (1817-81), a German philosopher, was born in Saxony, and studied medicine and philosophy at Leipzig. In 1842 he was appointed professor of philosophy at Leipzig, and in 1844 to a similar post at Göttingen. His first writings were on physiology, and in them he was thought by some to favour materialism. In 1841 appeared his *Metaphysik*, and in 1851 a work on the general physiology of natural life. But his chief work was *Mikrokosmos* (1856-64), 3 vols. This has been translated, and sets forth his views of the nature of man. His *Logic* appeared in 1874, and a work on metaphysics in 1879.

Loubet, EMILE, French statesman, was born in 1838. He became Premier in 1892, and President of the Senate in 1896. On the sudden death of M. Felix Faure (1899), M. Loubet was elected President of the French Republic by a large majority, and was succeeded by M. Armand Fallières in 1906.

Loucheux, Franco-Canadian name of a North American people, who call themselves *Dinjie* ("Men"), and who are a branch of the Dene-Dinjie (Athabaskan) family. They roam the Mackenzie basin from about lat. 67° N. to the Eskimo domain, and have also extensive hunting grounds in Alaska, but number scarcely 8,000 altogether, scattered over a territory some 200,000 square miles in extent. Formerly they visited Fort Good Hope, hence known to the Canadian trappers as *Fort des Loucheux*, but they have now withdrawn farther north, and bring their peltries to the Hudson Bay Company's agents at Fort Macpherson. The Loucheux are the same people as the "Quarrellers."

Loudon, JOHN CLAUDIUS (1783-1843), botanist and horticulturist, was born in Lanarkshire. In 1803 he published *Observations on laying out Public Squares*, and in 1805 a *Treatise on Hot-Houses*. Besides encyclopædias of gardening and plants

and other works on botany he published *Arboretum et Fruticetum Britannicum*.

Loughborough, a municipal borough of Leicestershire, near the Soar, with which it is connected by two canals, 11 miles N.W. of Leicester. It is the centre of a rich agricultural district, and was formerly noted for its malt. Among the public buildings are a 14th-century Decorated church with Perpendicular tower, grammar school, girls' school, free library, town hall, corn exchange, and infirmary. The chief industries are hosiery, bell-founding, iron-founding, dyeing, machine-, brick-, and glass-making, and coal-trading. The 17½-ton bell of St. Paul's was cast here in 1881. Pop. (1901), 21,508.

Louis, SIR THOMAS, BART., English naval officer, was born in 1758 and entered the navy in 1770. He was made commander in 1781 and captain in 1783. He took part in the victory of the Nile, and in 1801 served on the coast of Egypt. In 1804 he was promoted to rear-admiral. In 1805, at Nelson's request, he was given a post in the Mediterranean, and he accompanied Nelson on the chase of the French to the West Indies and back. In 1806 he was second in command at Sir J. Duckworth's victory off St. Domingo, and was created a baronet, and in 1807, with the same officer, he passed the Dardanelles. He died in the same year.

Louis I., LE DÉBONNAIRE, Emperor of the West Franks, reckoned by French writers as the first King of France, born in 778, was the son of Charlemagne, by whom in 806 he was granted a third of his empire, with the title of King of Aquitaine. On the death of his father, in 814, he became sole ruler, his brothers having died. He made many enemies by his attempts at firm government, and in 817 put out the eyes of his nephew Bernard, King of Italy, who had revolted. In 821 Louis's own sons by his first wife rose against him on account of the favour he showed to Charles, son of the second, and he was compelled to take a share only of the government. The Germans, however, supported him, and his authority was re-established, but only to be destroyed by a second revolt in 832, when Louis was treated with great cruelty by his eldest son, Lothair. The other brothers reinstated him, but he died in 840 at the outset of a fresh war with his sons and his grandson Pepin.

Louis IX., called ST. LOUIS, was born in 1215, and was only nine years old when his father died. The regency was in the hands of his mother, by whom he was carefully educated, till 1236. The early years of the reign were occupied in defeating a combination of some of the vassals with Henry III. of England. The result of the war was the acquisition by France of part of Saintonge, which, however, with other territory, he gave back by the Treaty of Abbeville in 1259. After recovering from a severe illness, Louis in 1248 sailed from Aigues-Mortes for a crusade against the infidels, leaving Blanche of Castile as regent. He took Damietta, and penetrated into the country, but in 1250 he fell ill, and, while

retreating with his troops, was made prisoner by the Mussulmans. After his ransom he passed four years in Syria, fortifying Tyre and other ports, and returned to France at the end of 1254. Louis IX. abolished judicial combats, and instituted the Parlement de Paris as a supreme court of justice where the royal officers were to decide upon quarrels between the vassals of the crown and their vassals. Skilled lawyers were introduced into France, and with their help the *Établissements de Saint Louis*, a collection of ordinances dealing with the administration of justice, especially between debtor and creditor, were drawn up. By the issue of the Pragmatic Sanction Louis forbade the raising of money for the Pope in France without the king's consent. He also made the royal coinage current everywhere, and obliged the great vassals to keep order in their domains, while he kept a hold upon the towns by reserving to himself the right of choosing the mayor from four candidates submitted to him by them. In 1264 Louis was called upon to arbitrate between Henry III. of England and the barons, and decided in favour of the king. In 1270 he undertook a second crusade. He set out for Tunis with 60,000 men; but died of the plague after a month's illness. He was canonised by Boniface VIII. in 1297.

Louis XI. was born in 1423, and succeeded his father, Charles VII., in 1461. While Dauphin he strongly opposed the influence of Agnes Sorel (q.v.), and lived the life of a practically independent prince in Dauphiné. His reign is divisible into two periods, the one preceding and the other following the year 1472. The first period saw a struggle against the great vassals, calling themselves the League of the Public Weal, aided by Charles the Bold of Burgundy, who set up against Louis his brother Charles. By the Treaty of Conflans in 1465 Louis was obliged to give up Normandy to the latter, and to restore to Burgundy certain towns on the river Somme. He recovered Normandy soon after; but in 1468, having placed himself in the power of Charles the Bold at Péronne, was only released on condition of ceding Champagne to his brother and of putting down in person the rebel Liégeois, whom he had incited to revolt against Burgundy. He was saved from further humiliation by the death of his brother, between whom and the daughter of Charles the Bold a marriage had been projected by the enemies of Louis. The French king from henceforth took the offensive, stirred up the Emperor and the Swiss against Burgundy, and on the death of Charles the Bold seized his daughter Mary's dominions. An indecisive war ended with the adding of Burgundy and Artois to the French crown by the marriage of the Dauphin with Margaret, daughter of Mary. Roussillon was also acquired by Louis from Aragon; and Edward IV. of England was bought off in 1475 by a pension and the empty title of King of France. Louis XI. died in 1483. The three chief aspects of his character—his cunning, his superstition, and his *bonhomie*—are well depicted in Scott's *Quentin Durward* and in Beauville's *Gringoire*.

Louis XII. was born in 1462, and succeeded Charles VIII. in 1498. The year after his accession he reunited Brittany to the French crown by marrying the widow of his predecessor. He claimed Milan, and possessed himself of it by the help of the Pope and Venice, but was deprived of it in 1513 by the Holy League and the Swiss. He also revived the claims of Charles VIII. on Naples, and obtained it by an alliance with Ferdinand of Aragon, but lost it in 1503. Five years later he joined the League of Cambray against Venice. An invasion of France by England, as one of the members of the Holy League, was followed by the "Battle of the Spurs" (Guinegate), and the marriage of Louis to Mary Tudor, sister of Henry VIII. Louis XII. died in 1515.

Louis XIII., son of Henri IV. and Marie de Medicis, was born in 1601, and succeeded his father in 1610. The queen-mother acted as regent until 1617, when the king assumed the government. During the next four years (1617–21) Louis was under the influence of the Duc de Luynes. In 1620 the re-establishment of Roman Catholicism in Béarn led to a fresh outbreak of the religious wars. By the Treaty of Montpellier (1623) the Edict of Nantes was confirmed, but the Huguenots lost their political privileges. For the next eighteen years (1624–42) the history of the reign of Louis XIII. is that of Richelieu and his policy. The Huguenots and the nobles were reduced to submission, the English attempt to relieve La Rochelle was defeated (1627), and the intrigues of Marie de Medicis were successfully met. In 1629 Louis was induced by Marie de Medicis to supersede Richelieu in favour of Marillac, but the cardinal speedily re-established his influence over the weak king by a personal interview. The only other serious attempt made to shake his power was the conspiracy of Cinq Mars in 1641. On the death of Richelieu in 1642 Mazarin became chief minister. Louis XIII. died in the following year. [RICHELIEU, MAZARIN, HUGUENOTS.]

Louis XIV., born in 1638, was still a child when he became king. He had been declared of age in 1651, but he took little part in the government till the death of Mazarin (q.v.) ten years later. The events which he had witnessed in his youth, and the counsels of Mazarin, set him firmly against constitutional government, and during more than half a century he was the actual ruler of France. He employed under him the old servants of Mazarin, but got rid of Fouquet (q.v.) as soon as the superintendent of finance showed that he aimed at the post of chief minister. The chief administrators under Louis were Le Tellier, and afterwards his son Louvois, Lyonne, and Colbert. A spirited foreign policy, successful at first, but in the end disastrous, was pursued. Charles II. and James II. became the pensioners of Louis, and the former restored Dunkirk for a sum of money. Pope Alexander VII. was humiliated, and the balance was held between England and Holland. In 1664 a contingent of French troops were sent to help Hungary against the Turks; and in the next year French troops secured the freedom of

Portugal from Spanish predominance. In 1667 Louis declared war against Spain, and, though compelled by the Triple Alliance to restore Franche-Comté, he retained his conquests in the Netherlands by the Treaty of Aix-la-Chapelle (1668). In 1672, having broken up by diplomacy the Triple Alliance, Louis overran Holland with his troops, but here met with the man who was to check his career of success, William of Orange. The taxation and distress caused by the war produced revolts in France, but in the course of 1678 and 1679 peace was made with every state. In 1681 the Chambers of Reunion awarded France practically the whole of Alsace, and in the same year Strasburg was seized; while in 1682 a synod of the clergy supported Louis against the Pope. In 1683, however, Louis lost his ablest minister by the death of Colbert, and two years later he deserted the traditions of the wisest French statesmanship by the revocation of the Edict of Nantes. In 1686 a league was formed against France by the Emperor, Spain, Sweden, and Holland, and was afterwards joined by other German princes and the chief states of Italy. It had, too, the secret support of the Pope, offended by the extension of the *régale* and the arrogant claims of the French Embassy in Rome, and after the Revolution of 1688 England also formed part of it. During the war, which lasted from 1689 to 1697, France had sometimes as many as six armies in the field, and Louis and William III.—the most powerful men in Europe—faced each other in the Netherlands. The question of the succession to the Spanish throne caused the last great war of the reign. At the Peace of Utrecht (1713) Philip, Louis' grandson, had to renounce the French crown, and to give up to England Gibraltar and Minorca, while the same power was ceded important possessions in North America by France; and Holland was secured from further aggression on the part of the latter. In the subsequent treaties with the Emperor and Austria France fared rather better. Louis XIV. died in the autumn of 1715. Since the death of Louvois, Madame de Maintenon, whom he had secretly married, had chiefly influenced him. [MAZARIN, COLBERT, HUGUENOTS, ETC.]

Louis XV., born in 1710, was the second son of the Duke of Burgundy, and the great-grandson of Louis XIV. His reign, like that of the two preceding, began with a regency, Philip, Duke of Orleans, being the regent. From 1723–26 Bourbon, the grandson of Condé, was chief minister. By him the young king was married to Marie Leczinska, daughter of the ex-King of Poland. Bourbon's selfish and oppressive government caused his removal in 1726, and for the next seventeen years (1726–43) the policy of France was directed by Fleury (q.v.). After the death of the old cardinal, Louis declared he would be his own minister; but in promising French support against England to Spain he allowed his own judgment to be overborne by that of Maurepas (q.v.). In 1744 he reached the height of his popularity when he took the command of his army in Alsace against the Austrians. On his recovery

from a dangerous illness at Metz he was saluted with the title of "le Bien-aimé." At the peace of Aix-la-Chapelle, however, in 1748, France had to give up Madras to England, to evacuate the Netherlands, and to acknowledge Maria Theresa's husband as emperor. England again became the chief enemy of France, and almost continuous war was waged between them in India and North America. In 1756 open war again broke out in Europe, but France was now allied with Austria against England and Prussia. Madame de Pompadour and Stainville, Duc de Choiseul (q.v.), now directed French policy. Choiseul was succeeded by an incapable triumvirate consisting of Maupeou, the Abbé Terrai, and the Duc d'Aiguillon. The first, who was Chancellor, abolished the Parlements, and set up a council of his own nomination to take their place—a proceeding which was approved by Voltaire, but suspected by the people as a step towards tyranny. For some time past Louis XV. had been sunk in debauchery, and he died execrated and deserted in 1774.

Louis XVI. was born in 1754, and succeeded his grandfather twenty years later. The triumvirate were immediately dismissed, and Maurepas, an old minister of Louis XV., placed at the head of affairs. Turgot (q.v.) was made controller of the finances, Malesherbes became Chancellor, and Vergennes foreign minister. The first was overthrown by a combination of the queen, the privileged classes, and Necker; and the Chancellor was forced to resign even before his colleague. Necker (q.v.) succeeded to the virtual control of the finances, though being a Protestant he could not nominally hold office, but he resigned in 1781. Vergennes, the foreign minister, nominally took his place, but all his attention was devoted to the policy of revenge upon England, which he attempted to carry out by alliance with the Americans and with Spain and the maritime powers in Europe. The war was hardly successful, and its financial results were disastrous, and hastened the Revolution. During the three years of Calonne's administration (1783–1786) the deficit increased by 35 millions, and the Assembly of Notables (which he assembled early in 1787) refused to sanction the measures by which he proposed to increase the revenue. Brienne, who had led the opposition, took Calonne's place and tried to force through the very measures he had just opposed. The Parlement demanded the summons of the States-General; and, though Orleans was exiled and two of the most violent members of the Parlement were arrested, this only increased its popularity, and the extreme step had to be taken of the creation of a Cour Plénière, to which its political functions were transferred. This provoked risings in Dauphiné and other provinces, and at the end of 1788 Brienne resigned, and the convocation of the States-General in the following May was promised. Necker was summoned to take the direction of affairs, and under his auspices the question of the constitution of the States-General was settled. On May 5th, 1789, they met, 578 of the 1,139 deputies belonging to the *tiers état*. Their formation into a single National Assembly, which

was not to separate until the national demands had been conceded, was met by an attempted *coup d'état* and the dismissal of Necker, the king always being swayed by a stronger will than his own. The taking of the Bastille, the recall of Necker, and the drawing up of a constitution which reduced the royal power almost to a shadow, followed. In the early summer of 1791 the king and queen escaped from the Tuileries and attempted to reach Varennes, a town on the eastern frontier, where there was a Royalist army; but Louis was recognised by the postmaster of St. Menehould and brought back with his family to Paris. On August 10th, 1792, the monarchy was overthrown, and, after a trial by the Convention, Louis XVI. was guillotined on January 21st, 1793.

Louis XVII. CHARLES, second son of Louis XVI. and Marie Antoinette, is sometimes so-called. He was born in 1785, and on the death of his elder brother in 1789 became Dauphin. Confined in the Temple Prison with Marie Antoinette in 1793, he was afterwards separated from her, and in all probability died on June 8th, 1795. As, however, it was known that attempts had been made to effect his escape from the Temple, a belief arose that the Dauphin was not really dead, and many pretenders to the title of Louis XVII. appeared, some of them gaining much credit among the Royalists. The most notorious of these were Hervagault, Brumeau, François Hébert, and Karl Wilhelm Naundorf, whose descendant still keeps up his pretensions in Holland.

Louis XVIII., brother of Louis XVI., was, during the reign of the latter, known as "Monsieur" and Comte de Provence. After leaving Paris in 1792, he did not, like the Comte d'Artois, join the *émigrés*, but passed the years of his exile at Hartwell, in Buckinghamshire. On the abdication of Napoleon in 1814 he was restored, and on June 2 published the charter of a new constitution, by which constitutional government was established, but the king reserved the initiation of legislation. On the news of the landing of Napoleon in the following March, and the desertion to him of Ney and Soult, Louis fled to Ghent, but returned to Paris after Waterloo. Though compelled by the clamour of the ultra-Royalists to dismiss Talleyrand and Fouché and to put Ney to death, Louis was determined not to be too reactionary. The moderate Ministry of the Duc de Richelieu was strengthened by the diminution of the indemnity to be paid by France and by the evacuation of her territory five years before the time agreed upon. In addition to this, France was readmitted to the councils of the Great Powers; but the policy of moderation was destined to failure. The Chamber of Deputies had to be renewed to the extent of a fifth annually, and when in 1818 Lafayette, Manuel, and Benjamin Constant were returned, Decazes succeeded Richelieu as head of a purely Liberal ministry. The censorship of the press was abolished, and 60 new peers were created in order to obviate opposition from the Upper House. By Villèle, however, the law respecting the renewing of the Chamber was repealed, and it was empowered to sit for 7 years,

and the Comte d'Artois became virtually ruler of France. Their Government also gained prestige by a successful intervention in Spain in 1823, by which Ferdinand VII. was enabled to hold his own against the Liberals. In 1824 Louis XVIII. died and his brother became the nominal as well as real ruler of France.

Louis Philippe, King of the French, was the son of the Duke of Orleans (Égalité) and Louise de Bourbon, a descendant of Madame de Montespan. He was born in 1773, and educated by Madame de Genlis (q.v.). In the days of the first revolution he was a Jacobin, and served with distinction at Valmy and Jemappes. After the defeat of Neerwinden he went over with Dumouriez to the Austrians, but refused to serve against his country preferring to become a tutor under the name of Chaband Latour in Switzerland. After passing three years in America he came to England in 1800 and lived at Twickenham for several years. In 1809 he married Amélie, daughter of Ferdinand IV. of Naples, and remained in Sicily for some time afterwards. At the Congress of Vienna in 1814 he was suggested as a candidate for the French throne, but was passed over in favour of the elder branch, to whom he always protested his fidelity, which was always, however, suspected. Louis Philippe again retired to England in 1815 but from 1817 to 1830 lived at the Palais Royal giving his support to the Liberal party. During the Revolution of July, 1830, he kept very quiet, and accepted from Charles X. the post of lieutenant-general of the kingdom; but in August he accepted the crown offered him by the Chamber of Deputies. Laffitte, Casimir Périer, and Thiers were Louis ministers, but Lafayette, who had had an equal share in the Revolution, was got rid of. Revolutionary outbursts took place in 1831 at Lyon, and in 1832 at Paris, and these were repeated in 1834 while the Duchess of Berri attempted a Legitimist rising in La Vendée. The attempt of Fieschi on the king's life in July, 1835, which was only one of seven, was followed by the enactment of severe repressive laws, and the government became despotic in character. From 1840 till 1848 Guizot conducted the Government. On February 22, 1847, the third French Revolution began with a great banquet which the leaders of the Opposition had arranged, and were not able to abandon. Next day the mob marched on the Tuileries, and the king tried to mend matters by again calling Thiers to his counsels and agreeing to Liberal measures. It was, however, too late; he was obliged to abdicate and to leave Paris under escort as quickly as possible. On March 3 the royal family landed at Newhaven, and two years later, in 1850, the Citizen King died at Claremont. Louis Philippe resigned his claims in favour of his grandson, the Comte de Paris (q.v.); his eldest son, the Duke of Orleans, had died from the results of a carriage accident in 1842. [GUIZOT, LOUIS BLANC, THIERS.]

Louisa of Prussia (1776-1810), the daughter of Charles of Mecklenburg-Strelitz, was born in

Hanover. In 1793 she married the Crown Prince of Prussia, afterwards Frederick William III., and was the mother of Frederick William IV. and the Emperor William. She had great qualities of mind and body, and was very popular. After the battle of Jena her active patriotism was especially conspicuous, as was her bearing in the face of Napoleon's insulting accusations. She is commemorated by a statue and monument at Charlottenburg, and gives her name to a Prussian order.

Louisiana, a state of America on the N. of the Gulf of Mexico. It is on the right bank of the Mississippi, and is traversed by the Red, Sabine, Washita, and Pearl rivers, and has Mississippi on the E., Tennessee on the W., and Arkansas on the N. The length from north to south is 200 miles, with a breadth of 290 miles and an area of 43,000 square miles, much of which is alluvial, varied by sandy pine hills and uplands rising to a height of 470 feet. For several miles inland there are tide-covered marshes, and the lowlands generally are protected by dykes ("levees") from inundation. The uplands are in the N. and N.E., and in other parts there are bluffs, and isolated hills rising from the plain, and interspersed with watercourses called bayous. Much of the marshland has been reclaimed and sown with rice. The climate generally is moderate, and the rainfall abundant, while the vegetation is very luxuriant, and there are forests of pine, oak, beech, poplar, cypress, cotton-wood, and magnolia. Oranges, figs, and other fruits are abundant, and cotton, sugar, and maize are grown. Among the industries are rice-cleaning, sugar-refining, shingle, tank- and machinery-making, and the manufacture of tobacco, boots, and clothing. The negro element outnumbers the white, which is mostly of French and Spanish origin. The state, which belonged to France, was sold to the United States by Napoleon in 1803, and is still governed by the civil law based upon the Code Napoléon. There is a State university at Baton Rouge (the capital), and another university at New Orleans.

Louisville, in Kentucky, a port and capital of Jefferson county, on the Ohio, near the Falls of Ohio, where the river sinks 22 feet in 2 miles, and 130 miles below Cincinnati. The town, which is well built, is on a plain sloping towards the river. Louisville is the chief tobacco-market of the world, and other industries are pork-packing, distilling, tanning, gas- and water-pipe making, and machinery, casting, and cement works. Several railway lines converge hither, and the Ohio is crossed by two railway bridges.

Lourdes, a French town in the Hautes-Pyrénées, 12 miles S.W. of Tarbes, is chiefly noted as a place of pilgrimage, owing to the presence of a miraculous healing spring which burst forth at the command of the Virgin, who appeared to a peasant girl, named Bernadette Soubirous, in 1858. So runs the legend. There is a basilica and a Church of the Rosary, and many pilgrims resort to the spot, especially in August. There are marble and slate quarries, and some prehistoric caves in the

neighbourhood. The Romans had a castellum on the rock at whose foot Lourdes is situated.

Louth. 1. A maritime county of the province of Leinster in Ireland, extending from the river Boyne to Carlingford, and having a coast-line on the Irish Sea. Its average width is 10 miles, and its area 202,000 acres, 40 per cent. of which is grass-land. The surface generally is flat except in the neighbourhood of Carlingford, and the coast-line is low and sandy save where Clogher Head rises to a height of 180 feet. Cultivation is advanced, and good potatoes, oats, barley, and turnips are grown. Coarse linen is manufactured, and oyster and other fishing is carried on. The county returns two members to Parliament. Drogheda and Dundalk are important towns. The county is rich in Celtic and other antiquities, among which are the sculptured crosses at Monasterboice, round towers at Monasterboice and Dromiskin, and ruins of abbeys in various places. Pop. (1901), 65,741.

2. A town of Lincolnshire, on the Lud, 25 miles N.E. of Lincoln, and connected by canal with Hull. Much agricultural implement- and machinery-making is carried on, and there is a well-endowed grammar school.

Louvain (Flem. *Leuven*), a town in the Belgian province of Brabant, 19 miles E. of Brussels. In the 14th century it was extensive, rich, and prosperous, and a great seat of the cloth industry, but a revolt in 1382 drove its cloth-workers to England and caused the town to decay. The walls are now demolished, and much of the former city is now occupied by gardens. The university was once greatly famed, and Louvain has still the chief Catholic university of Belgium. Brewing is the chief industry, and there is some bell-founding, and manufacture of paper, lace, leather, and chemicals. The hotel de ville dates from the 15th century; St. Gertrude's church has some beautiful carved oak stalls, and in St. Peter's church is a notable roodloft, and some metal work of Quentin Matsys.

Louvois, FRANÇOIS MICHEL LE TELLIER (1641-91), was born at Paris, and his father was Chancellor and Secretary for War. The son became Minister of War in 1668, and so reorganised the army as to be entitled to the name of its founder. He introduced the principle of a standing army, and forced the nobles to enter as officers, and he also organised the commissariat and hospital arrangements. The officer (Martinet) who aided him in carrying out the arrangements has become proverbial.

Louvre (French, "the opening,") a small turret, more or less open at the sides, formerly erected on halls, kitchens, etc., as a means of ventilation and affording egress to the smoke.

Lovat, SIMON FRASER (1667-1747), a Scottish nobleman, was born in Ross-shire. In 1683 he graduated at Aberdeen, and was a good classical scholar. In 1694 he received a commission in King William's army, and in 1699 succeeded to the title, having meantime been outlawed for abduction. He appears to have played a double game in politics

between the Government and the Jacobites, and lost his head after the rising of the 'Forty-five.

Love-Bird, any small parrot of the African genus *Agapornis*, so called from their fondness for their mates. The term is also applied to the allied genus *Psittacula*, from tropical America, and to budgerigars (q.v.).

Lovelace, RICHARD (1618-58), an English poet whose claim to remembrance lies in his writing *To Althea from Prison*, *To Lucasta*, and one or two other charming lyrics. He was born at Woolwich, and educated at Charterhouse and Oxford. In 1642 he was imprisoned by Parliament, and prevented from aiding the king, save with his money. In 1648 he was again imprisoned, but set at liberty after the king's death. A tragedy called *The Soldier*, and a comedy, *The Scholar*, are lost, but *Lucasta* and *Posthume Poems* remain.

Lover, SAMUEL (1797-1868), was born in Dublin. He at first distinguished himself as a marine- and miniature-painter, having Lord Brougham as a sitter, and exhibiting a portrait of Paganini at the Royal Academy. In 1832 he published *Legends and Stories of Ireland* (illustrated by himself), in 1836 *Rory O'More* (which he dramatised), and in 1842 *Handy Andy*. In 1837 he came to London to work, but failing sight compelled him to confine his efforts to a series of entertainments called "Irish Evenings." Besides making a collection of lyrics of Ireland, he wrote *Molly Bawn*, *The Low-backed Car*, and *The Four-leaved Shamrock*.

Lowe, SIR HUDSON (1769-1844), was born in Galway. In 1787 he entered the army, and for some years served in the Mediterranean. Then he joined the Prussian army under Blücher. Later, in his capacity of Governor of St. Helena, he had the care of Napoleon, and was much criticised on account of his alleged severity towards his prisoner. In 1825 he was appointed to a command in Ceylon.

Lowell, a manufacturing town in the north of Massachusetts, U.S., 25 miles N.W. of Boston. It is situated on the Merrimac, which is here joined by the Concord, and forms a centre in which five railways converge. Lowell is the chief seat of the cotton manufacture in the United States; there are also important woollen and linen factories, powder-mills, paper-mills, works for the manufacture of machines, etc. These factories are mostly worked by water-power derived from the Merrimac, which here has a fall of over 30 feet, but steam power is also largely employed. The mill-hands are remarkably prosperous and intelligent, and there are numerous literary clubs and similar institutions.

Lowell, JAMES RUSSELL (1819-91), American man of letters, was born at Cambridge, Massachusetts. After completing his education at Harvard, he was called to the bar, but never practised. His first volume of poetry, *A Year's Life* (1841), was followed three years later by another volume containing several fine pieces. *Conversations on some of the Old Poets* (1845) gave indication of his powers of literary criticism, whilst

his reputation as a poet was much increased by the *Indian Summer Reverie* and the *Vision of Sir Launfal* (1848), founded on the legend of the search for the Holy Grail. *A Fable for Critics* (1848) is a witty but good-humoured satire on certain well-known American authors. But the chief work of this period was the *Biglow Papers* (1846-48), in which the Mexican War is presented in the most unfavourable light; these compositions are remarkable alike for their keen humour, their satirical force, the justice of their political views, and their insight into the characteristics of the rural population of America. The second series (1864), occasioned by the War of Secession, are less humorous, but display a loftier vein of sentiment. In 1855 Lowell succeeded Longfellow as Professor of Modern Languages and Literature at Harvard. He edited the *Atlantic Monthly* from 1857 to 1862, and the *North American Review* from 1864 to 1866. Of his remaining works the most important were the volumes of critical essays entitled *My Study Windows* (1871) and *Among my Books* (two series, 1870, 1876). Lowell was United States minister to Spain from 1877 to 1880; in the latter year he was transferred to England, but was recalled on the fall of the Republican party, and returned to America in 1885. His *Democracy* and other addresses delivered in England were republished in 1886.

Lowth, ROBERT (1710-87), a learned English prelate, was educated at Winchester and Oxford, where he became professor of Poetry in 1741. He was appointed Bishop of Oxford in 1766, and of London in 1777. His chief work was his *Lectures on the Sacred Poetry of the Hebrews* (1753), written in Latin.

Loxia. [CROSSBILL.]

Loyola, IGNATIUS DE (IÑIGO LOPEZ DE RECALDE) (1491-1566), founder of the Society of Jesus, was descended from an illustrious Spanish family, and was born in the province of Guipuzcoa. After living at the Court as a page, he entered the army, and for many years led the gay life of a soldier. At the siege of Pampeluna by the French (1521) one of his legs was fractured by a cannon ball, and the other was injured by a splinter of stone; and he was removed to the castle of Loyola. During his confinement he amused himself by reading romances, and when these were exhausted had recourse to the *Life of Jesus* and the *Lives of the Saints*. His spiritual nature was gradually awakened, and he determined to devote himself to a life of religion. His first project was a pilgrimage to Jerusalem, but before undertaking it he repaired to Catalonia, where he passed a year amongst the poor in St. Lucy's hospital at Manresa. It was here that he composed the celebrated *Spiritual Exercises*. The difficulties he encountered during his pilgrimage (1523-24) in his efforts to convert the infidels induced him to qualify himself for the office of instructor by a renewed course of study. After studying Latin under Jerome Ardebal, at Barcelona, he resided at the universities of Alcalá and Salamanca; but he aroused the hostility of the Inquisition by persisting in delivering public

discourses, and, after spending some time in prison, removed to Paris in 1528. Whilst a poor student at Paris he became acquainted with Xavier, Lainez, and other kindred spirits, with whom he united to form the society which was subsequently organised as the Jesuit order. After some difficulty and delay the Papal sanction to the foundation of such an order was obtained in 1538, and confirmed by a Bull in 1540. In 1541 Loyola was chosen general with absolute power. The remainder of his life was spent at Rome. [JESUITS.]

Lozère, a department of south France, bounded by Cantal, Haute-Loire, Aveyron, Gard, and Ardèche; area 1,996 square miles. The surface is rugged and mountainous, consisting mainly of a plateau from 2,300 to 3,000 feet above the sea-level; in the S.E. are the Cevennes, containing Mont Lozère (4,884 feet), from which the department takes its name. Numerous rivers rise within the department, flowing to the Garonne, Rhone, and Loire. In general the climate is too severe for corn, but sheep are reared in large numbers, and chestnuts and potatoes are important products.

Lubbock, SIR JOHN (Lord Avebury) (born 1834), man of science and social reformer, was born in London and educated at Eton. Several useful banking reforms are due to him; but his reputation rests chiefly on his works dealing with insect life and primitive man. These include *Pre-historic Times* (1865), *The Origin of Civilisation* (1870), and *Ants, Bees, and Wasps* (1882). Other works are *The Pleasures of Life* (1887), *Peace and Happiness* (1909), &c. He represented Maidstone (Liberal) from 1870 to 1880, since when he represented the University of London (since 1886 as a Liberal Unionist). Of the numerous measures passed by him the most important is the Bank Holiday Act (1871), which added four annual public holidays to the two already existing. In 1900 he was raised to the peerage as Lord Avebury.

Lübeck, a free city of Germany, 40 miles N.E. of Hamburg by railway. It lies in a hollow at the foot of a hill, between the Trave and the Wakenitz, about 10 miles above the mouth of the former. The territory belonging to the town covers some 115 square miles, and includes the port of Travemünde, situated at the point where the Trave falls into the Baltic. Lübeck was founded by the Saxons in the 12th century, near the site of the old Slavonic or Wendish town of Liubice. It was made a free city by Frederick II., and played a prominent part in the history of the Hanseatic League (q.v.), the fall of which led to its own decline. Lübeck joined the North German Confederation in 1866, and the Zollverein in 1868. It is governed by an executive body, consisting of fourteen senators chosen for life, and a legislative house of burgesses containing 120 members. The town wall was levelled in 1802, and converted into walks and gardens. The most notable buildings are the cathedral, begun in 1173, which contains a fine altar-piece; the church of St. Mary, dating from the early part of the 14th century, with two towers over 400 feet in height; the town-hall, the

school of navigation, and the public library. Lübeck is an important centre of the carrying trade of northern Europe generally, but especially of that between the interior of Germany and the shores of the Baltic. There are cigar factories, breweries, distilleries, iron-foundries, etc., but none of the industries are very important.

Lublin, a government in the S.E. of Russian Poland, area 6,497 square miles. The capital, Lublin, is situated on the Bistritza, 96 miles S.E. of Warsaw. The cathedral dates from the 13th century. There is an extensive trade in wool and corn. About half the inhabitants are Jews.

Lubrication. When two solid bodies are rubbed together heat is produced and work wasted. To reduce this waste, rubbing surfaces in machine bearings, etc., are lubricated by inserting a film of fluid between them. This film of fluid prevents the surfaces from actually touching, and the friction between each surface and the fluid is much less than would be the case if the lubricant were not present. The fluid is usually oil, and this should be chosen of such a consistency that the pressure on the bearing will not force it from between the surfaces; heavy bearings must thus have thicker oil than light ones. Tallow and thick vegetable or mineral greases are used for heavy bearings, such as those of railway carriages; petroleum of various degrees of thickness are largely used for general machinery, while refined sperm or neatsfoot oil is used for small work, such as the pivots of sewing-machines and clocks.

Lucan (MARCUS ANNÆUS LUCANUS), (39-65 A.D.), Roman poet, was the son of L. Annæus Mella, a brother of the philosopher Seneca. He was born at Corduba, in Spain, but at an early age his parents took him to Rome, where he was educated by the foremost teachers of the day. At first he was favoured by the Emperor Nero, who made him quæstor and augur; but he incurred his enmity by defeating him in a public literary contest, and was forbidden henceforward to recite or publish his poems. Hereupon he threw himself into the conspiracy of C. Calpurnius Piso. The plot was discovered, and he sought to save his life by turning informer, accusing even his own mother, Acilia; but his efforts were fruitless, and he was forced to commit suicide by opening his veins. His fame rests entirely on his *Pharsalia*, an epic poem describing the war between Cæsar and Pompey, which terminates abruptly in the middle of the 10th book. It is characterised by an easy flow of language, which sometimes rises into eloquence; the sentiments are generally patriotic, and almost everywhere it breathes the lofty Stoic philosophy in which its author had been trained. On the other hand, many passages are marred by an undue straining after verbal effect.

Lucanids, the family of beetles of which the Stag Beetle (q.v.) is the type.

Lucas van Leyden (LUCAS JACOBSZ), (1494-1533), a celebrated Dutch painter and engraver, born at Leyden. His best picture is the *Last Judgment* in the town-hall at Leyden.

Lucca, a province of north Italy, extending northwards from the Arno; area 544 square miles. The soil is fertile, and the olive and other kinds of fruit are largely cultivated; the caper is a special product of this district. The chief town, Lucca, stands on a plain beside the Serchio, 11 miles N.E. of Pisa. The Duomo, a fine edifice dedicated to St. Martin, was begun in the 11th century; it contains some valuable paintings and interesting relics. There are several other handsome buildings, and a large number of churches, chiefly built of Carrara marble. The aqueduct of 459 arches, conveying water from the Pisan Hills, was constructed in 1820. Lucca is the seat of an archbishop. The celebrated mineral baths are situated in the valley of the Serchio, some 12 or 15 miles to the N. The silk manufacture, established here in the 11th century, is still thriving, and olive-oil is exported in large quantities.

Lucerne, a Swiss canton, bounded by those of Aargau, Zug, Bern, Unterwalden, and Schwyz; area 579 square miles. The surface, which is flat or gently undulating in the N., rises in the S. to meet the Bernese Alps, reaching in Mount Pilatus a height of 6,998 feet. Cattle-rearing and dairy-farming are carried on in the mountainous districts, and where the soil is more fertile corn and fruit are grown. The inhabitants speak German, and for the most part belong to the Church of Rome.

The LAKE OF LUCERNE—called also the "Lake of the Four Forest Cantons," viz. Lucerne, Schwyz, Unterwalden, and Uri—is a magnificent sheet of water of very irregular form, somewhat resembling a roughly-hewn cross; the area is 44 square miles. The scenery towards the N. and W. is of a gentle pastoral character, but, as the banks become more rugged and precipitous, it increases in grandeur, and the most beautiful part of the lake is that which lies within the canton of Uri.

The town of LUCERNE is picturesquely situated at the N.W. end of the lake, where the Reuss issues from it. It is much frequented by tourists. Outside the walls is the Lion of Lucerne, designed by Thorwaldsen and cut out of the solid rock as a memorial of the Swiss Guards slain at the Tuileries in 1792.

Lu-Chu, the inhabitants of the Lu-Chu (Liu-Kiu, Riu-Kiu) archipelago between Japan and Formosa; apparently of Japanese stock, but showing Corean affinities in their habits and traditions. The language is an archaic form of Japanese, akin to the Satsuma dialect; it has never been cultivated, and the so-called "Lu-Chu" version of the Bible is really composed in pure Japanese. All are Buddhists, and are noted especially for the respect shown to the dead (a reminiscence of ancestor-worship), who are deposited in large and sumptuous tombs for three years, after which the remains are collected and preserved in urns. (Basil Hall, *Voyage, etc., to Corea and the Great Loo-Choo Island; Church Missionary Intelligencer*, August, 1879.)

Lucianus, or LUCIAN (*circa* 120–200 A.D.), a humorous Greek writer, was born at Samosata, on

the Euphrates, in the Syrian district of Commagene. After practising as an advocate at Antioch, he travelled through Greece, Italy, and Gaul, acquiring much wealth by his rhetorical displays. At the age of forty he returned to his own land, and there wrote his principal works, which are mostly in the form of dialogues. During the latter part of his life he was procurator of part of Egypt. Some of Lucian's most amusing compositions were written with the express purpose of throwing ridicule on the decaying religion and philosophy of the age. To this class belong the *Dialogues of the Gods*, the *Sale of the Philosophers*, the *Banquet*, and the *Icaro-Menippos*, which describes a journey to Olympus by way of the moon, undertaken by a dissatisfied student of philosophy in quest of truth. The chief interest of other dialogues, such as the *Timon*, consists in their graphic account of contemporary social life. The famous *Dialogues of the Dead* are intended to show the emptiness of everything which seems precious to mankind. Lucian had a wide experience of human nature, and a wonderful faculty of producing grotesque images and ideas. His narrative is always extremely lively, and the purity of his language approaches that of the best Attic.

Lucifer Matches. [MATCHES.]

Lucigen is an apparatus for producing an intense light by combustion of crude paraffin and other cheap oils. The oil is contained in an iron vessel, from which it is forced by compressed air in the form of spray, which burns in a suitable burner. A store of compressed air is usually retained ready for use in an iron cylinder. There are many different forms, which vary in details of construction.

Lucilius (*circa* 148–103 B.C.), the first Roman satirist, was born at Suessa Aurunca, in Campania. He was the intimate friend of Scipio Africanus, whom he accompanied to the siege of Numantia, and of Lælius. Fragments of his *Satires* remain.

Lucknow, a city of India, capital of the province of Oudh (q.v.), on the Gúmí, 42 miles N.E. of Cawnpur. Viewed from the outside, the town presents an imposing appearance; but in reality the streets are narrow and crowded, and the buildings, which produce a striking effect from a distance, are seen on a nearer view to possess all the worst faults of architectural design. The most magnificent edifice is the Imámbara or mausoleum of Asaf-ud-daulá, the fourth Nawáb of the Oudh dynasty, erected in 1784. There are also two fine mosques, four gorgeous royal tombs, two large palaces, an observatory, etc. Canning College was established in 1864. The Martinière College is intended for the sons of soldiers, and has a branch for the education of girls. The manufactures include gold and silver brocade (made from small wires), muslins and other textile fabrics, glass-work, and moulding in clay. There are also railway workshops and a paper factory, and the town has a large trade in grain, cotton, salt, molasses, and leather. Lucknow is memorable for the gallant defence maintained by the garrison during the Mutiny; it was besieged by the rebels from July, 1857, to March,

1858, when they were finally defeated by Sir Colin Campbell. [LAWRENCE, OUTRAM.]

Lucretius, CARUS TITUS (*circa* 95-52 B.C.), an eminent Roman poet, concerning whose life nothing certain is known. His *De Rerum Natura*, a didactic poem in hexameter verse, contains six books, in which are expounded the principles of the Epicurean system of philosophy. It is, perhaps, the sole example of a philosophical poem in which the didactic purpose is successfully maintained without destroying the literary value of the work. This is the more remarkable as the materialistic character of the views enforced might naturally be supposed to be very repugnant to the poetic temperament. Yet the poem contains passages which for beauty and grandeur are unequalled by anything else in the whole range of Latin literature. Lucretius is said to have been driven mad by a love philtre, administered by his wife, and to have committed suicide; but some think that this story was invented by his enemies.

Lucullus, L. LICINIUS (*circa* 110-58 B.C.), Roman general, served as quæstor under Sulla in the first Mithradatic War (88-84), elected consul in 74, he received Cilicia as his province, and prosecuted the war against Mithradates, expelling him from Pontus, and defeating Tigranes, King of Armenia, with whom he had taken refuge. But the insubordination of his troops prevented him from bringing the war to a successful close, and in 66 he was superseded by Pompey. After his return to Rome he became noted for his luxurious mode of life.

Luddites, the name assumed by the rioters in Yorkshire and other northern and midland counties, who, in 1811-12, and again in 1816, destroyed all the machinery on which they could lay their hands, supposing that its introduction had caused the prevalent distress. The name was taken from Ned Ludd, a Leicestershire idiot, who had destroyed some stocking-frames about thirty years before.

Ludlow, EDMUND (1617-92), was born of a good family in Wiltshire. He was educated at Oxford, and in 1638 became a student in the Temple. After serving in the Parliamentary army, he was elected member for Wiltshire (1646), and at once joined the extreme party. He succeeded Ireton as commander-in-chief in Ireland, but after six months was superseded by Fleetwood (July, 1652). In consequence of his resistance to Cromwell's usurpation he was imprisoned in 1655, but he was subsequently allowed to retire to Essex. He was instrumental in securing the return of the Rump, and again held the chief command in Ireland for six months in 1659. In August, 1660, he escaped through France to Switzerland, and eventually settled at Vevey, where he died. His *Memoirs* were first published in 1698-99.

Lugano, a lake, partly in the Swiss canton of Ticino and partly in Lombardy. It lies to the south of the Alps, nearly 900 feet above the sea, and is 15 miles long from N.N.E. to S.S.W., with an extreme breadth of two miles. The banks are steep, lofty, and well wooded, and the scenery in

many parts is very grand. On the N.W. side, in the Swiss portion, stands the town of Lugano, surrounded by vineyards, olive plantations, and chestnut woods; the church of Sta. Maria degli Angioli contains paintings by Luini.

Lugger, a vessel of one, two, or three masts, carrying on each a quadrilateral lug-sail bent upon a yard that hangs to the mast obliquely, from a point at about one-third of its length. There is generally a running bowsprit; and large luggers have two or three jibs, as well as lug-shaped top-sails. Many ships' boats are rigged as luggers, such boats doing well when close-hauled, and sailing very near the wind.

Lughmani, the natives of the Lughman district, Jalalabad, north-east Afghanistan; they are said to be chiefly Ghilzaes and Tajiks, though speaking a language closely allied to that of the Siah Posh Kafirs (Kafiristan), and nearly the same as the Pashāe and Kohistani north of Kabul. All these are Galcha tongues intermediate between the Iranian and Sanskritic families.

Luina, a Bantu people of south central Africa, who occupy the Upper Zambesi plains, and especially the kingdom of Lui, formed by the dismemberment of the Makololo empire. It was the Luina nation that was chiefly instrumental in overthrowing this state, and restoring the old Barotse power in the Zambesi basin. Unlike most Bantu peoples, the Luina are rather stock-breeders than tillers of the soil. They own large herds, and are also skilful workers in iron, making all their own weapons and utensils; but at the time of Serpa Pinto's visit (1878) they had greatly degenerated, and polygamy had become universal. By the recent treaties with the Chartered South Africa Company (1892) the Luina have been brought within the sphere of British influence. [MAKOLOLO.]

Luini, or LOVINI, BERNARDINO (*circa* 1470-1530), a painter of the Lombard school, was born at Luino, in the territory of Milan. His works closely resemble those of Leonardo da Vinci. Some of his best paintings are in the Ambrosian Gallery at Milan, some at Lugano (q.v.).

Luke, SAINT, the evangelist and supposed author of the Acts of the Apostles, was, according to a tradition recorded by Eusebius, Jerome, and others, a native of Antioch in Syria. He accompanied St. Paul in his missionary journeys, and is described by him as his "companion" (2 Tim. iv. 11), his "fellow-worker" (Philem. 24), and the "beloved physician" (Col. iv. 14). The earliest authority which expressly ascribes the authorship of the third Gospel to St. Luke is the Muratorian Canon (*circa* 170). The statement of Irenæus that St. Luke committed to writing what St. Paul preached to the Gentiles, has been taken to mean that the real author was St. Paul; Eusebius mentions that some put this interpretation on the expression "my gospel" in Rom. xvi. 25, 2 Tim. ii. 8; others think that St. Luke was assisted by St. Paul in its composition. The Acts of the Apostles was accepted as the work of St. Luke by

Irenæus, Clement of Alexandria, Tertullian, Jerome, and the other Fathers by whom it is mentioned. Their testimony was never called in question till within a recent period. The similarity of the Gospel and Acts in language and style is strongly in favour of the ancient tradition. Even those who regard the book as a compilation suppose St. Luke to be the author who writes in the first person in Acts xvi. 10, and thus this passage affords a glimpse into his personal history. Jerome states that he lived to be over eighty, and died at Patræ in Achaia; but, according to Gregory Nazianzen, he suffered martyrdom.

Lully, LULLI, or LULLE, RAYMOND (1234-1315), "the Enlightened Doctor," was born at Palma, in Majorca, and became seneschal in the court of the king of Aragon. Believing that he had received a divine call, he resolved to devote his life to the conversion of the Mohammedans; and, after spending many years in the study of philosophy, theology, and Arabic, sailed to Tunis in 1291. To this period of preparation belongs the *Ars Magna* or *Generalis*, in which is set forth a kind of *memoria technica* regarding the method to be followed in the investigation of truth, based on the Aristotelian logic. His disputations at Tunis ended in his banishment after he had been thrown into prison and narrowly escaped execution. He returned to Africa in 1306, now visiting the city of Bugia, but experienced exactly the same fortune. During a second sojourn at Bugia the natives dragged him outside the city and stoned him. He was rescued by some Genoese merchants, but died on the homeward journey.

Lumbago. A painful affection of the muscles of the lumbar region. Its exciting cause is usually exposure to cold; the pain is often very distressing and especially aggravated by movements. Dry heat and friction are the most useful forms of local treatment. The skin over the affected muscles should be well rubbed with turpentine liniment, and warm cotton-wool then bandaged over the loins. The belladonna and chloroform liniment is also of use in some instances. The administration of salicylate of soda internally is advocated. Vapour baths are often beneficial.

Luminosity is produced when any body is sufficiently heated. A ball of iron will emit light if its temperature is about 1300° C., and it then looks white hot. The temperature required to make a gas luminous is extremely high, and flame (q.v.) is then produced. It often happens that a flame gives very little light—a spirit lamp is an example of this—but the introduction of something solid into the flame at once increases its luminosity. Except in a very few cases, solid particles of some kind must be present in order that a flame shall give light. The luminous part of a gas flame contains countless particles of solid unburnt carbon, but if air is supplied to the burner so that these particles are burnt up, the flame becomes almost invisible. The luminosity of a flame is increased if the temperature can be raised, when, for example, a substance is burnt in oxygen instead of air. It is

also increased if the surrounding atmosphere can be condensed. A spirit lamp has been found to give a bright light when burnt in compressed air.

Lumpsucker, any fish of the genus *Cyclopterus*, of the Acanthopterygian Family Discoboli (in which the ventral fins are modified to form a sucking disk). There are three species from the Arctic and north temperate zones. The body is short and thick, the head and the skin covered with tubercles. *C. lumpus*, the Common Lumpsucker, is abundant on the northern shores of Britain. Scottish fishermen call the male the Cock, and the female the Hen Paddle, from the fancied resemblance of the dorsal ridge to the comb of a cock. The coloration is brilliant, and the flesh, which differs in quality at different seasons, is eaten.

Lunacy. [INSANITY.]

Lunar Caustic consists of the nitrate of silver, AgNO_3 , melted and cast into sticks. It is employed as a cautery, acting powerfully on organic substances. If taken internally it attacks the mucous membrane, producing inflammation. In small doses, however, it may be used medicinally in stomachic and nervous affections. The name is a relic of the alchemistic time, when silver was represented by the sign of the crescent moon, and known by the name of Luna.

Lunar Observations, or the LUNAR METHOD, a way of observing the angular distance between the moon and the sun or a fixed star, and comparing it with the computed distance in the Nautical Ephemeris, for the purpose of ascertaining the longitude at sea. The method, a very ancient one, was readopted and perfected by Dr. Nevil Maskelyne when on a mission to observe the transit of Venus in 1761; and it was Dr. Maskelyne who first proposed and superintended the preparation of the *Nautical Almanac*, the tables in which relieve the calculator from all the more laborious part of the process.

Lunar Theory explains the moon's motions in the heavens by mathematical reasoning, founded on the law of gravitation. If the earth were the only body which attracted the moon the theory would be very simple, but the attractive force of the sun causes many irregularities in the moon's path. The sun's attraction on the moon varies with the position of earth and moon in the earth's orbit, and with the position of the moon in her own orbit, so that the moon is a little behind or in front of the place she would occupy, if her path were a true ellipse with the earth in one focus. This same attractive force causes the moon's orbit to slightly alter its inclination to the ecliptic—the average inclination being about 5° . The moon's orbit, as a whole, moves round the earth every nine years, and her nodes (q.v.) move backwards on the ecliptic about $19\frac{1}{2}^{\circ}$ every year. It will thus be seen that the sun's attractive force is alone sufficient to make the Lunar Theory extremely difficult and complex; but a further small inequality is due to the fact that the earth is not a perfect sphere. Venus also exerts a slight influence.

Lunatics. A lunatic is a person "who hath had understanding, but by disease, grief, or any other cause, hath lost the use of his reason or has become *non compos*," that is, of mind so unsound as to be incapable of conducting himself or his affairs, and this last term (according to Sir E. Coke) is the most legal—the term lunatic being in its derivation applicable only to one that has lucid intervals, depending, as some formerly imagined, upon the change of the moon, though now used technically as well as popularly in the more extended sense of a person affected by any species of insanity supervening since his birth. To all lunatics, as well as to idiots, the sovereign is guardian. The Lord Chancellor, to whom, by special authority from the sovereign, the custody of both idiots and lunatics is entrusted upon petition or information, grants a commission in the nature of the ancient writ *de lunatico inquirendo* to inquire into the party's state of mind. The proceedings on such commission are regulated by the Lunacy Act, 1890, which repeals, but in substance re-enacts, the three earlier Lunacy Acts of this reign, 16 & 17 Vict., c. 70; 25 & 26 Vict., c. 86; 45 & 46 Vict., c. 82. Under this Act the commission is directed to certain judicial officers known as Masters in Lunacy, but the inquiry into the state of mind of the party as authorised by such commission, usually takes place before a jury on an issue directed by the Lord Chancellor to be determined in that manner. The verdict on such inquisition must be upon the oath of twelve men at the least, and after the due examination (unless in special cases) of the alleged lunatic. And such examination may be either in open court or in private, as the judge trying the case shall direct. If, by the verdict of the jury, he be found *non compos*, the care of his person with a suitable allowance for his maintenance in some private or public asylum (where an asylum is requisite), is usually committed to some friend who is then called his *committee*. By the provisions of the successive Lunacy Acts of Queen Victoria's reign above referred to, every person found by inquisition to be lunatic is to be personally visited, seen, and reported upon by official *visitors*, four times at least every year, and at such other times as the Lord Chancellor may direct. Our Statute Law contains also a variety of other provisions for the protection and management of persons labouring under this calamity, but space will not admit of their further notice here.

Lund, two groups of Baluchi tribes: (1) Lunds of Lori, in the northern parts of the Dera Ghazi district, with 6 branches and 32 subdivisions. (2) Lunds of Tobi, in the Jampur district, N. of Harand, with 3 branches and 23 subdivisions.

Lund ("grove"), a city in the Swedish province of Gothland, 10 miles N.E. of Malmö. It was one of the most important towns in the mediæval kingdom of Denmark. There is a fine Romanesque cathedral, built in the 11th century. The university, founded in 1668, is attended by about 800 students; the buildings include a library of over 120,000 volumes, observatory, zoological museum, botanic garden, etc.

Lundy (Scandinavian "puffin island"), a rugged

and precipitous island at the mouth of the Bristol Channel, 11 miles N.N.W. of Hartland Point. It forms part of the county of Devon, and is about 3 miles long with an average breadth of 1 mile. There are only two or three places at which a landing can be effected. The cliffs are frequented by innumerable sea-birds. There are remains of an ancient stronghold, "Morisco Castle," and other antiquities. Near the southern extremity stands a lighthouse, with a revolving light 540 feet above the sea.

Lüneburg, a town of Hanover, situated on the Ilmenau, a tributary of the Elbe, 31 miles S.E. of Hamburg by railway. It was formerly the capital of the principality of Brunswick-Lüneburg, from the ruling family of which the sovereigns of Great Britain are descended. [BRUNSWICK.] In the narrow streets which form the central part of the town there are many picturesque old houses. The mediæval buildings include an interesting rathhaus and the churches of St. John and St. Michael, dating respectively from the 14th and 15th centuries. There are salt and gypsum mines, iron-works, and linen, woollen, and cotton manufactures. To the S. of the town is the Lüneberg Heath, 50 miles in extent, the heather of which yields excellent honey. Sheep are also raised, and the peat furnishes a valuable supply of fuel.

Lungs. The two lungs lie within the cavity of the thorax, the heart being situated between them. During life the lungs are always more or less on the stretch, and the lung surface lies close beneath the chest wall, the lungs filling up the cavity of the thorax. The lungs are surrounded by a kind of bag or sac, composed of a serous membrane called the pleura, but this pleural sac is practically empty, the layer which covers the lung surface lying close to the outer layer, which is adherent to the chest wall.

The air in the lungs is, in fact, under pressure, the atmospheric pressure being transmitted from the mouth to the ultimate extremities of the air passages, by which the lung is permeated; there is thus a continual distending force acting upon the lung from within, and there is no counterbalancing pressure applied from without, for the lungs lie in the air-tight chest, shielded, as it were, from the pressure of the atmosphere outside, by the walls of the thorax. The lung is thus blown up, so to speak, by pressure from within, and, containing as it does a large amount of elastic tissue, it is distended and made to fill the thoracic cavity. If an opening is made in the chest wall of an animal after death, the lungs at once collapse, for the outer surface of the lung is now exposed to atmospheric pressure as well as the inner surface, and these pressures counterbalancing one another the stretched elastic tissues of the lungs are no longer maintained in a state of tension, but contract and produce a shrinking up of the lung. When the lung collapses, the two layers of the pleura part company, the layer covering the lung shrinking with the lung, and the outer layer remaining adherent to the chest wall.

It has been stated that the lung is permeated by air passages. The trachea (q.v.) is the main

channel of communication between all these air passages, on the one hand, and the larynx, mouth, and outer air, on the other.

The trachea divides into two tubes, the two *bronchi*, one for each lung; each bronchus subdivides, and each division of the bronchi again subdivides and so on. These subdivisions bring us at length to the minute tubes which are known as the *ultimate bronchioles*. Each of these bronchioles expands into a funnel-shaped sac, into which open a number of minute pouches. These pouches are the *air cells*, and the sac with its pouches is called an *infundibulum*. The lungs are divided into *lobes*—the right lung having three lobes, and the left lung two lobes. These lobes or divisions of the lungs are again divided into *lobules*, and each lobule may be regarded as made up of a number of the infundibula already alluded to.

The entire inner surface of the air passages of the lung is lined by a mucous membrane, covered internally with epithelium. External to the mucous membrane is a supporting framework containing elastic tissue, glandular tissue, and, in the case of the bronchi and trachea, cartilage. The epithelium of the larger air passages comprises several layers of cells, the innermost layer consisting of ciliated epithelial cells. In the smaller tubes, the epithelium and the outer supporting framework become attenuated, the number of layers of cells diminishes until only one layer is left, and finally in the infundibula and air cells this single layer of cells is no longer ciliated but consists of much-flattened epithelial cells. These ultimate air passages consist of nothing more than a delicate membrane which has elastic fibres coursing over it, is lined internally with flattened cells and supports the rich network of capillary blood-vessels distributed upon its outer aspect. The blood in the capillaries of the lung is thus spread out over a large aërating surface, for while each air cell is a minute microscopical object, the combined area of the surface of all the air cells is considerable, and there is, therefore, abundant opportunity for the interchange of gases between the blood and the air in the air cells.

Venous blood is conveyed from the right ventricle of the heart to the lungs by the pulmonary artery. It is there distributed throughout the capillaries, takes up oxygen and loses carbonic acid by exposure to the air contained in the air cells, and is returned by means of the pulmonary veins to the left auricle of the heart. [RESPIRATION.]

Diseases of the lung, *see* BRONCHITIS, CONSUMPTION, EMPHYSEMA, EMPYEMA, PLEURISY, PNEUMONIA.

Lupercalia, in the ancient Roman religion, was a festival held on the 15th of February in honour of Lupercus, a pastoral deity of primitive character. Goats and dogs were sacrificed, and the Luperci, or priests of Lupercus, then ran round the city walls, striking everyone they encountered with thongs formed from the skins of the victims. In the case of women these blows were supposed to prevent or cure sterility. Mark Antony (q.v.) was one of these priests.

Lupine (*Lupinus*), a genus of Leguminosæ,

belonging to the tribe Genistææ. In the Mediterranean region it is represented by annual species; but in America, where they are more numerous, several of them are perennial woody under-shrubs. They have peltate, palmate leaves, a bi-labiate calyx, a pointed keel to the corolla, monadelphous stamens, and a flattened pod. *L. albus*, cultivated in ancient Egypt, is still grown in Italy for forage and for its seeds which, when boiled, are a valuable article of food. The long erect racemes of white, blue, purple, or yellow flowers make all the species ornamental garden plants.

Lupus, an affection of the skin, characterised by the development of an eruption of an erythematous or tubercular character with subsequent scarring, and, it may be, extensive destruction of skin tissue. It often occurs in association with enlargement of glands, particularly of the cervical glands, and with other affections of a scrofulous nature. The disease is not attended with much discomfort, but is very distressing on account of its unsightly appearance, and is, moreover, usually indicative of a bad state of health. *Lupus erythematosus* is the least severe form of the disease; it usually affects the face, its course is very protracted; it commences, as a rule, in adult life, and is more common in females than in males. *Lupus non exedens* particularly affects the nose and cheek; tubercles appear in the first instances, and are followed by changes in the skin tissue, resulting in the production of a greyish-white unsightly scar. In *lupus exedens* there is extensive destruction of tissue with distortion of the shape of the eyelids, nose, or mouth, according to the seat of the mischief. A bacillus closely resembling the bacillus of tubercle has been discovered in the tissues affected with lupus. Treatment comprises the administration of tonics and cod-liver oil, with change of air when possible. Of recent years a very considerable measure of success has been obtained by means of the Light treatment.

Lurcher, a cross between the greyhound and collie, often with a strain of spaniel blood. The lurcher is the dog of the poacher and gipsy, and rivals, if he does not excel, the collie in intelligence.

Luri (LORI), a collective name of the gipsies of Baluchistan and Sindh, showing marked affinities to those of Europe, are chiefly tinkers, bards, strolling minstrels, cattle (camel) lifters, and kidnappers. Each band has a "king," and many are retainers of the powerful Baluchi families.

Lurs, a main branch of the Kurdish race, in west Persia, and especially in the province of Luristan, named from them. Four primary divisions: (1) *Amale* ("Workmen"), mostly in village settlements, with 30 sub-groups; (2) *Balagirveh* ("Highlanders"), in the uplands between the Dizful and Kashgân rivers, with 8 sub-groups and endless minor divisions; (3) *Silsile*, with 4 sub-groups and over 40 minor divisions; (4) *Dilfan*, with 4 sub-groups and 14 minor divisions. The Dilsans are hated by all the others and called *Lek* or *Kurd*, in an opprobrious sense, although the Lurs themselves are originally Kurds, as shown by

their language, which differs but slightly from that of the Kirmanshah Kurds. The explanation seems to be that most of the Lur branch became Mohammedans at an early date, while the Kurds, Leks, and Dulfans remained heathens, hence were despised by the converts. In Luristan Schindler often heard bad Mohammedans called *Kurd* or *Lek*, and it is this use of these terms that has caused so much confusion in the ethnology of west Persia. All these semi-nomad wild tribes are called *Pish-i-Kuh* ("Before the Mountains") by the Persians, in reference to their position on the eastern slopes of the western ranges, facing the central plains. (A. H. Schindler, *Reisen*, etc., in *Zeitschrift für Erdkunde*, No. 80, 1879.)

Lusatia, a district of Germany, between the Elbe and the Oder, formerly consisted of two separate margraviates, Upper or Southern, and Lower or Northern Lusatia. They both belonged to Saxony from 1635 to 1815, when Lower Lusatia and part of Upper Lusatia were incorporated with Prussia.

Lusatians, a Wendish (Slav) people, who still survive in the Prussian and Saxon provinces of Upper and Lower Lausitz, where they are entirely surrounded by German-speaking populations. The village communities, still speaking the old Wendish language formerly current throughout the Elbe basin, number about 140,000 souls, but are gradually becoming absorbed by the dominant German element.

Lushai. [Dzo.]

Lustre, a somewhat complex character of minerals, not easy of definition, consisting in the quality and intensity of the light reflected from their surfaces. The *kind* or *quality* of lustre depends partly upon structure, partly upon transparency, and largely upon refractive power; the *degree* of lustre, upon the amount of reflection. Minerals with perfectly smooth faces are either metallic, adamantine, resinous, or vitreous. If opaque and with an index of refraction (q.v.) above 2.5, they are *metallic* (1), as in most native metals and their sulphides, such as galena and pyrites. If with an index between 2.5 and 1.9, they are *adamantine* (2), whether transparent, as diamond, or opaque, as blend. If translucent only, with an index between 1.9 and 1.7, they are *resinous* (3), as in garnet. An indefinable variation of this, resembling wax, seen in some opal and in hornsilver, is termed *waxy* (4). If transparent and with an index between 1.8 and 1.3, as in ice, fluor, quartz, rock-salt, calcite, and sapphire, the mineral is termed *vitreous* (5). Numerous lamellæ within a translucent mineral, whether well-developed cleavage-planes, as in mica and selenite, or the result of incipient decomposition, produce *pearly* (6) cleavage. Fibrous structure, such as that of asbestos and satin-spar, produces *silky* (7) lustre. In degree, lustre is either (1) *splendent*, where a well-defined image is reflected, as in specular hæmatite; (2) *shining*, where only ill-defined images can be reflected, as in celestine or baryte; (3) *glistening*, where there is a general surface

reflection but no recognisable image, as in mica; (4) *glimmering*, when there is only a faint reflection from scattered points on the surface, as in flint; or lastly (5) *dull*, when there is scarcely any white light reflected from the surface—a character mainly exemplified by ochres and other earthy minerals. Unlike faces of the same crystal often differ in lustre, pearly and silky lustre especially being commonly confined to particular faces, those parallel to the cleavage.

Lute (Arabic, "the wood"), a stringed musical instrument of the guitar class, introduced into Europe by the Arabs soon after their conquest of Spain. It was very popular during the Middle Ages and up to the close of the 17th century, but, except in the East, now exists only in the form of the guitar, banjo, and similar instruments. When it had reached its full development the lute usually consisted of the following parts: a back, which was usually rounded or pear-shaped; a belly with a large sound-hole in the centre or sometimes several sound-holes; the neck with frets formed by fastening strings of catgut tightly round it in such a manner as to produce semi-tones; the head or cross on which were the pegs or screws for tuning the strings; and the bridge to which the lower ends of the strings were fixed. The strings, the number of which was gradually increased from eight to twenty-four, were made of catgut and were arranged in pairs of unisons, half the number passing over the finger-board and the other half lying beside it. Lutes were generally ornamented with ivory, tortoiseshell, and mother-of-pearl.

Luther, MARTIN (1483-1546), was the eldest son of Hans Luther, a miner, and was born at Eisleben, in Saxony. When he was six months old his parents removed to Mansfeld, where he attended the Latin school. After spending a year in the Franciscan school at Magdeburg, he was sent at the age of fifteen to Eisenach. During this period his means were so scanty that he was forced to sing for bread in the streets, till the beauty of his voice attracted the notice of Ursula Cotta, wife of the burgomaster of Eisenach, who received him into her household. In 1501 he entered the university of Erfurt, where he studied philosophy and the classics with the view of becoming a lawyer, taking his Master's degree in 1505. Meanwhile several circumstances—chief among which was the sudden death of a friend—had given his thoughts a religious bent. He now withdrew to the Augustinian monastery at Erfurt. Here he passed through a season of religious despondency, but his peace of mind was gradually restored, mainly through the intelligent and kindly sympathy of the Vicar-General, Staupitz. The fundamental doctrines of the Lutheran creed, which were now gradually taking shape, were, in large measure, due to the influence of Staupitz as well as Luther's own study of the Bible and the works of St. Augustine. In 1508 Luther was appointed professor of Philosophy at Wittenberg, where his public sermons, as well as his Biblical lectures to students, attracted many adherents. A visit to Rome in 1511 produced in his mind a deep impression of the corruption of the

Church, and certainly hastened on his revolt from her authority. He felt constrained to take a bold course when, in 1517, John Tetzel, a Dominican friar, arrived in Saxony with a commission from Leo X. authorising him to sell indulgences. When Tetzel had reached Jüterborg, near Wittenberg, there appeared on the door of the Castle church in the latter town a document containing ninety-five propositions against the practice. This determined step excited the greatest enthusiasm, and Tetzel was compelled to leave the electorate. But there was no lack of adherents to the Papal cause, and Luther was soon drawn into several controversies, the most noteworthy being that with his old friend and fellow-student, John Eck, of Ingolstadt. As Luther remained obstinate, he was summoned to Rome, but the Elector of Saxony interfered, and finally it was arranged that the case should be tried by the Legate Cajetan at Augsburg. Cajetan's bias soon became evident, and Luther thought it prudent to leave the town. The Pope now assumed a more conciliatory attitude, but Luther continued to preach, argue, and write against the abuses of the Church, and in 1520 Leo issued a bull against him containing forty-one theses. This bull Luther publicly burnt outside the gates of Wittenberg, and was in consequence summoned before the Emperor Charles V. and the German Diet at Worms (1521). He refused to retract, and was not allowed to support his cause by argument; but no attempt was made to detain him by force. He was, however, put under the ban of the Empire, and the Elector of Saxony, fearful for his safety, caused him to be seized by a band of armed knights, as he was journeying homewards through the Thuringian forest, and conveyed to the Castle of Wartburg. In this solitude he began his translation of the New Testament, which was completed and published in 1522. The disturbances caused by Carlstadt and his associates recalled him to Wittenberg (March, 1522), where he earnestly strove to calm the excited peasantry, at the same time remonstrating with the nobles on their tyrannical conduct. In 1524 he renounced his monastic vows, and in 1525 married Catherine von Bora, who had been a nun. In the same year occurred his unfortunate controversy with Erasmus regarding the freedom of the will. In 1529, in a conference held at Marburg, he engaged in a bitter dispute with Zwingli concerning the Lord's Supper (q.v.). Luther took no part in drawing up the Protestant document called the "Confession of Augsburg" (1530), which was solely the work of Melancthon. His closing years were embittered by domestic sorrows and dissatisfaction with the religious and social condition of Germany. He died at Eisleben, and was buried at Wittenberg. Of all his numerous works, which include various hymns, sermons, and commentaries, none, with the exception of his translation of the Bible, has exercised more influence than the *Table Talk*, which is everywhere marked by the same rude vigour, homeliness, and religious fervour.

Lutheran Church, THE, was founded by the followers of Martin Luther (q.v.), whose tenets

differed in many points from those of the Reformed Church (q.v.) or Calvinists. The whole body of Lutheran doctrine is based on nine creeds or confessions—the Apostles', Nicene, and Athanasian Creeds; and six documents of the 16th century, viz. the Augsburg Confession (q.v.), the Apology for the Augsburg Confession, the Smalkald Articles, Luther's two Catechisms, and the Form of Concord. Only the three creeds and the Augsburg Confession are accepted by all Lutherans; the shorter catechism, however, is almost universally recognised. Lutheran theology as a whole may be said to be summed up in the doctrine of justification by faith. The main cause of the discussion between the "Evangelical" and "Reformed" Churches has been the difference in their views regarding the nature of the Lord's Supper (q.v.). Owing mainly to the excessive anxiety of its members to preserve the reformer's teaching free from corruption or change, as well as the depressing influence of the Thirty Years' War, there grew up in the Lutheran Church a spirit of narrow orthodoxy which opposed as innovations all efforts after a deeper religious life. This was especially noticeable in the case of Pietism (q.v.). At a later date Rationalism (q.v.) threw apace amidst the prevailing formality and listlessness, and gained a footing within the Church itself which it never afterwards lost. The efforts made by Friedrich Wilhelm III., after the close of the Napoleonic War, to effect a reconciliation between the Lutheran and Reformed Churches, and found a "United Evangelical Church," met with partial success—at least as far as Prussia was concerned—although a large number of the former body seceded under the name of "Old Lutherans." The views of the "New Lutherans," who aim at promoting a more liberal spirit in regard to dogma, were first promulgated about 1848. Lutheranism is the national religion of Sweden, Norway, and Denmark, and there is also a Lutheran Church in many other lands. In Germany the Church is under the general superintendence of the Cultus Minister in Berlin, but each state has its own clerical council, presided over by the civil ruler.

Luton, a municipal borough and market town in South Bedfordshire, about 19 miles S. of Bedford. It is celebrated for its manufacture of straw hats and bonnets, and does a considerable export trade. There are also iron and brass foundries. It was incorporated in 1876. Pop. (1901), 36,404.

Lu-tze, aborigines of south-west China in the mountains on both sides of the Lu-tze-kiang (Upper Salwen), N. of the Lissu domain. The national name is *Anong*, pronounced *Nu* in Pekin, and *Lu* in Sechuen, whence the form *Lu-tze* by the addition of the usual meaningless syllable *tze*. Their chief town is Cha-mu-tong, and they reach thence north to the Tibetan province of Tsarong; are of the same stock as the Mosso and Lissu, consequently of Caucasian rather than Mongolic type. But, unlike the neighbouring Lissu, they are a gentle, peaceful people, never raiding on the settled populations, and scarcely ever leaving their mountain homes except to pay the annual tribute,

which is exacted both by the Chinese and the Tibetan authorities. Although still addicted to the chase, they also till the land in a primitive way, raising crops of maize, millet, or rice in sufficient quantities to supply their own wants and to barter with the Tibetans for salt and woollen garments. All are fetishists, peopling the forests, rocks, and streams with evil spirits, authors of all their misfortunes. The language is very soft, but supplies no terms for the year, months, or days, so that these rude tribes are unable to keep any chronological record of events. (Lepper, *Notes on the Singpho and Khamti Country*, in *Proceedings of the Asiatic Society of Bengal*, 1882, p. 64.)

Luxembourg, FRANÇOIS HENRI DE MONTMORENCI-BOUTTEVILLE, DUC DE (1628-95), a famous French general, was the posthumous son of the Comte de Montmorency-Boutteville. He served under Condé in the Spanish army (1653-59), and again in the invasion of Franche-Comté (1667-68). In 1672 he was placed in command of the army which invaded Holland, and by his masterly retreat from Utrecht (1673) established his reputation as a general of the first rank. In 1675 he was created a marshal of France. After 12 years of neglect he received the command of the army of Flanders, and gained a series of brilliant victories, defeating the Prince of Waldeck at Fleurus (1690), and William III. at Steenkerk (1692) and Neerwinden (1693).

Luxemburg (Germ. "Lützelburg"), an ancient hereditary possession of the House of Orange, now comprises (1) a grand-duchy ruled by the king of the Netherlands, (2) a province in the kingdom of Belgium. After the fall of Napoleon the Congress of Vienna made it an independent member of the German Confederation, under the sovereignty of the king of Holland (1815). Luxembourg joined itself to Belgium on the formation of that kingdom in 1830, but by the Treaty of London (1839) that part which now forms the grand-duchy was restored to Holland. On the dissolution of the German Confederation the connection with Germany ceased, and the Prussian troops were withdrawn. (1) The grand-duchy is bounded by the Belgian province on the W. and N.W., by Rhenish Prussia on the E. and N.E., and by France on the S. The area is 998 square miles. It belongs mainly to the table-land of the Ardennes; the surface consists chiefly of moors and swamps, alternating with wide tracts of forest. It is drained by the Moselle, which skirts the S.E. border. The chief industry is the rearing of live stock. There is an abundance of iron ore, which, together with timber, forms the chief export. The inhabitants are Low German in race and speech, and profess the Roman Catholic religion. French, however, is the official language, and is spoken in the upper ranks of society. The government is carried on by a House of Representatives containing 42 members, 21 of whom retire every three years. The capital, LUXEMBURG, 32 miles S.W. of Trèves, is partly situated on the summit of a precipitous rock, 200 feet in height, and partly on the plain below it. It was formerly considered almost

impregnable, but was dismantled under the Treaty of London in 1867. There are manufactures of leather, gloves, and linen. (2) The products, industries, and general characteristics of the Belgian province are very much the same as those of the grand-duchy. The area is 1,706 square miles.

Lycanidæ, a family of small butterflies in which the front legs in the male are only slightly imperfect. The three best-known groups included in this family are the Coppers (q.v.), Blues (q.v.), and Hairstreaks (q.v.). The larvæ often exude a liquid of which ants are fond. To obtain it the eggs are collected by ants, and the larvæ reared in the ant-hills.

Lycanthropy. [WEREWOLF.]

Lycia, in classical geography, was a mountainous district on the S. coast of Asia Minor between Caria and Pamphylia. It is semicircular in form, the landward side forming the chord of the arc. The original inhabitants, the Solymi (or Milyæ), are described in the *Iliad* as a brave and warlike race, and, according to the same authority, the chieftains who led them were of Æolid extraction. Lycia is supposed to have been colonised by Hellenes from Crete. The Lycians maintained a successful resistance against Croesus, and were the last people in Asia Minor to submit to the Persians. The county is rich in architectural remains.

Lycurgus (b. circa 820 B.C.), the Spartan law-giver, according to tradition was the son of Eunomos, King of Sparta, acted as guardian for his nephew Charilaus, journeyed abroad to study the laws of other countries, and on his return issued his code, which sought to subordinate private interests to those of the commonwealth. [SPARTA.]

Lydgate, JOHN (circa 1370-1451), poet, was born at Lydgate near Newmarket, and became a monk in the Benedictine Abbey of Bury St. Edmund's. He was patronised by the first two Lancastrian kings, and during the reign of Henry VI. seems to have occupied a position corresponding pretty closely with that of the poets-laureate of a later age. He wrote on a variety of themes, usually suggested by the circumstance of the time or the demands of his patrons. His chief efforts were three narrative poems entitled the *Falls of Princes*, the *Troy Book*, and the *Story of Thebes* (from Boccaccio), the two former of which extend to a prodigious length. Lydgate's works are tedious in the extreme, and utterly devoid of artistic sensibility or imaginative power. His satirical poem, *London Lackpenny*, is more lively than most of his productions, and throws much light on the manners of the age.

Lydia, in classical geography, was a district of Asia Minor, bounded by the Ægean on the W., Mysia on the N., Phrygia on the E., and Caria on the S. The ancient civilisation of Lydia, which bears some traces of a Hittite origin, exercised a powerful influence on the Ionic colonists who settled along the coast, and through them on the general development of Greek religion and culture. The third dynasty of Lydian kings, founded by Gyges (q.v.), ruled at Sardis from the beginning of the 7th to the middle of the 6th century B.C.; the last

and most powerful monarch of this line was Croesus (q.v.), who extended his dominions as far as the Halys on the E., and overcame the Greek colonies on the W., but was eventually overthrown by the Persians. Lydia was afterwards conquered by the Macedonians, formed part of the kingdoms of Syria and Pergamus successively, and eventually passed to the Romans.

Lyell, SIR CHARLES, BART. (1797–1875), a celebrated English geologist, was born in Forfarshire and educated at Oxford, where he obtained a second class in classics. He was called to the bar in 1825, but whilst a student at Lincoln's Inn he had become the pupil and friend of Dr. Buckland, through whose influence his mind was powerfully drawn to geology, and in 1827 he abandoned the legal profession. After travelling on the Continent and contributing papers to the *Transactions* of the Geological Society, he published his *Principles of Geology*, which established the science on an entirely new basis. For the old notion of cataclysms and catastrophes were substituted the Huttonian doctrines, according to which the various changes in the earth's surface and in the rocks composing its coast have been caused by physical agencies identical with those now in operation; in this way geology became a branch of inductive science. Lyell was president of the Geological Society in 1836, and again in 1850. He visited America in 1841 and 1845, and published narratives of both expeditions written in a popular style. He was one of the earliest adherents of the Darwinian theory, which he defended and expounded in *The Antiquity of Man* (1863).

Lyly, or LILLY, JOHN (1553–1606), novelist and dramatist, was born in Kent and educated at Magdalen College, Oxford. After leaving the university he attached himself to Lord Burghley, from whom he does not seem to have received much encouragement. The first part of his famous novel, *Euphues, or the Anatomy of Wit*, was published in 1579; *Euphues and his England* followed in 1580. He describes the travels, gallantries, and studies of a youth named Euphues, who in the first part visits Naples and Athens, and in the second journeys to England with his friend Philautus. The book abounds in moral dissertations, classical allusions, and descriptions of life and manners, such as the age loved; but its popularity was mainly due to its peculiarities of style, which were much admired by Elizabeth's courtiers, and gave rise to the manner of speaking and writing called "Euphuism." Its characteristics have been described by Dr. Lachmann in his *Euphuismus* (1881) as "a combination of antithesis with alliteration, assonance, rhyme, and play upon words, a love for the conformity and correspondence of parallel sentences, and a tendency to accumulate rhetorical figures." Lyly's comedies mark a step forward in the development of the English drama. He is supposed to have died in poverty and neglect in the early part of the 17th century.

Lymph is the clear, slightly alkaline fluid which circulates in the lymphatic vessels. It coagulates on removal from the body and contains corpuscles,

the lymph corpuscles which resemble the white corpuscles of the blood. It differs from the chyle (q.v.) in containing no fatty particles. The system of *lymphatics* originates in a capillary network which is present in the various parts of the body. From this network the lymph is passed on into collecting lymphatic vessels which convey it to lymphatic glands; the lymph passes through these glands and is collected by main lymphatic trunks which finally convey it into the blood stream. The main trunk, into which the lymph of the lower limbs, left arm, and left side of the trunk, is conveyed, is called the *thoracic duct*. This duct runs upwards in front of the vertebral column and empties itself into the blood stream at the point of junction of the subclavian and internal jugular veins on the left side of the body. The lymph from parts of the body not already enumerated is conveyed by a second main trunk, which empties itself into the blood stream at the point of junction of the right subclavian and right internal jugular veins. The lymph consists of material exuded from the capillaries of the blood less such substances as are abstracted therefrom by the tissues, and plus the waste products cast off by the various tissues in the course of their growth and activity. The lymph undergoes certain changes in its passage through the lymphatic glands. Their nature is ill understood; but one change may be alluded to, namely, that the lymph becomes a readily coagulable fluid, the property of coagulation not being possessed, as a rule, by the lymph prior to its passage through a lymph gland. The circulation of the lymph is maintained in some animals—*e.g.* the frog—by contractile lymph hearts; in man, the circulation is largely dependent upon the valves which exist in the lymph vessels and which only permit of movement of the lymph in an onward direction. Muscular contraction, the movements of respiration, etc., in this way all take effect upon the lymph contained in the lymphatics in one direction (that of the lymph circulation), movement in the reverse direction being prevented by the valves.

Lymphatic Glands. [LYMPH.]

Lynch Law (whence the verb *to lynch*), the summary execution of persons obnoxious to society or to certain private individuals without any legal procedure. The term is said to be derived from a Virginia planter named Charles Lynch (1736–96) who in the early years of the American Revolution was in the habit of suspending the friends of the English Government by their thumbs till they cried "Liberty for ever." Although repugnant to dwellers in lands which have long been civilised, "lynching" may sometimes produce salutary effects in newly-settled communities where the administration of justice is as yet inadequate. But, whatever merits may be claimed for it, it has certainly been carried to an extreme in the southern and western states of America.

Lyndhurst, JOHN SINGLETON COPLEY, BARON (1772–1863), English statesman, was the son of the painter John Singleton Copley. He was born at Boston, Massachusetts, but when he was three years old his parents removed to England. He received his

education at Chiswick and the university of Cambridge, and was called to the bar in 1804. At first he was not very successful, but his abilities gradually attracted notice, and after his acceptance of a Government seat in the House (1818) his progress became rapid. The sincerity of his political views at this time has been doubted, but henceforward, at any rate, he showed himself a consistent and even bigoted Tory. He became Solicitor-General in 1819, Attorney-General in 1824, and Master of the Rolls in 1826, and was Lord Chancellor under Canning, Goderich, and Wellington (1827-30), and Chief Baron of the Exchequer and leader of the Opposition from 1830 to 1834. His opposition to all the measures of the Government during the great epoch of reform (1835-41) was very acceptable to one section of his party, who proposed him as leader in place of Peel. He was again Chancellor from 1841 to 1846, when he ceased to take an active part in public life.

Lyndsay, or LINDSAY, SIR DAVID (*circa* 1490-1555), Scotch poet, is supposed to have studied at St. Salvator's College, St. Andrews. He was "usher" to James V. from 1512 to 1524, when the influence of the queen-mother and the Douglas faction occasioned his withdrawal from Court. He was afterwards sent on embassies to the Netherlands (1531), France (1536), and other countries, but probably spent most of his time at his country seats, the Mount, near Cupar, and Garmylton or Garleton, in East Lothian. His chief poems were *The Dreme* (1528), describing in the form of a vision the anarchy and misery which prevailed in Scotland, and *The Satyre of the Thrie Estaitis* (1535), in which the vices of all classes of society are unsparingly attacked. These works are characterised by humour, shrewdness, and much knowledge of the world. They contributed greatly to bring about the Reformation in Scotland, and maintained their popularity in that country for over 200 years.

Lyndoch, THOMAS GRAHAM, LORD (1748-1843), British general, was born in Perthshire. During the Peninsular War he was at first second-in-command under Sir John Moore (1808-9). Subsequently he won the victory of Barossa (1811), took St. Sebastian, and, after crossing the Bidassoa, led the British army into French territory.

Lynn, KING'S LYNN, or LYNN REGIS, a parliamentary and municipal borough and seaport in Norfolk, on the right bank of the Ouse, about two miles above the Wash and 48 miles W.N.W. of Norwich. Prior to the Reformation, when it passed into the hands of the Crown, it was the property of the Church and was called Bishop's Lynn or Lynn Episcopi. On the land side there are remains of ramparts and a fosse, and the town contains several timber-built houses, enriched with carvings. The buildings include a fine church ranging in style from Norman to Perpendicular, a Guildhall, a custom-house (1683), and a grammar school which existed in the reign of Henry VIII. Lynn received its first charter from King John in 1205. During the Middle Ages it was one of the

chief ports in the kingdom, and, though it long since lost this position, it still carries on an extensive shipping trade, mainly in corn, coal, timber, and the produce of the fisheries. There are two large docks, constructed between 1869 and 1884. Many of the inhabitants are employed in ship-building, iron-founding, malting and brewing. Pop. (1901), 20,289.

Lynx, any individual of a group of the smaller Felidæ, from the northern and temperate regions of both hemispheres, distinguished by a short tail, tufted ears, long limbs, especially behind, and long soft fur, for the sake of which they are hunted. They frequent wooded and rocky places, and feed on sheep, lambs, and poultry. The European Lynx (*Felis lynx*), which ranges into Asia, is about three feet long, rufous grey above with spots of darker shade, and whitish beneath. It runs into several races or varieties, and is probably not distinct from the American form. The Tibet Lynx (*F. isabellina*) is pale yellow.

Lyons (Fr. *Lyon*), the second city of France, is situated in the department of the Rhone, 314 miles S.S.E. of Paris by railway and 218 N. by W. of Marseilles. The town is mainly built on a long narrow tongue of land formed by the Rhone and the Saône, which run almost parallel from the N. for some distance before they meet. Owing to the confined area, the houses are generally high and the streets narrow, giving the town a gloomy appearance, but improvements have taken place in this respect of late years. On the opposite banks of the two rivers there are several handsome suburbs, connected with the central peninsula by over twenty fine bridges. On the latter are situated most of the chief buildings, including the Palais des Arts, or museum; a library containing over 120,000 volumes, besides MSS. and art collections; the town-hall, built 1646 and restored 1702; the Hôtel Dieu, said to have been founded early in the 6th century; the lycée, hôtel de ville, arsenal, etc. Here are also the mediæval churches of St. Martin d'Ainay and St. Nizier. On the west bank of the Saône is the important suburb of Fourvières (the Roman *Forum Vetus*) situated on the slope of a hill which rises to a height of 410 feet and commands beautiful and extensive views, Mont Blanc being visible when the atmosphere is clear. This quarter contains the cathedral-church of St. John, the Palais de Justice, the archbishop's palace, the church of Notre-Dame, and that of St. Irenée, in the crypt beneath which is a vast collection of bones, said to be those of the martyrs who perished in the persecution under Severus. The name *Lyon* is derived from *Lugdunum*, the Latin form of the Gaulish name, which was adopted by a band of Greek refugees who settled here in 590 B.C. The Roman colony was founded in 53 B.C. Perhaps the most notable event in the long history of the town is the fearful havoc wrought by Collot d'Herbois and his associates in consequence of the resistance offered by the inhabitants to the decrees of the Convention. It has long been celebrated for its silk manufactures, which were introduced from Italy in the 15th century. Although the factory system exists

to some extent, this industry is for the most part carried on by workmen living in their own houses and assisted by journeymen and apprentices; the number of power-looms is about 20,000, of hand-looms nearly 85,000; the population of the northern suburb of La Croix Rousse is composed almost entirely of silk-weavers. The other manufactures include chemicals, hats, paper, machinery, and gold and silver ornaments. Besides importing raw silk and exporting silk fabrics, Lyons carries on a large general trade, owing to its central position.

Lyons, SIR EDMUND LYONS, FIRST LORD, naval officer, was born in 1790, and was made a lieutenant in 1801. He distinguished himself at the capture of Banda Neira in 1810, and at the storming of Marrack in 1811, and was made a commander in 1812, and a captain in 1814. In 1835 he was knighted and made minister-plenipotentiary to Greece, and he was created a baronet in 1840 and a G.C.B. in 1844. He became a rear-admiral in 1850; and in 1854-56 was commander-in-chief in the Mediterranean with temporary rank as admiral. For his services during the Russian War he was created a peer in 1856. Promotion to vice-admiral's rank followed in 1857, but Lord Lyons died in 1858.

Lyre, the chief musical instrument of the ancient Greeks. It belonged to the harp class, and was very much like the cithara. The body, which was hollow and rested on the lap whilst the instrument was played, commonly consisted of a tortoise-shell covered with bull's-hide; above it rose two horns, united at their upper extremities by a wooden cross-piece, from which the strings descended, their lower ends being attached to a bridge on the body. The strings were usually seven in number. The lyre was introduced into Greece from Egypt, but its original home appears to have been Palestine.

Lyre-Bird, any of the three species of Australian passerine genus *Menura*. These birds, rather smaller than a hen pheasant, are found in the brush of New South Wales, ranging north into Queensland and south into Victoria. The general plumage is sooty brown, the tail in the males of *M. superba* and *M. Victoria* is of sixteen feathers, the two outer curve like the sides of a lyre, the two long middle ones have vanes only on one side, and in the remaining twelve the barbs are widely separated. In *M. alberti*, the most northern form, the tail is not lyre-shaped, and the two outer feathers are shorter than the rest.

Lysander (d. 395 B.C.), a distinguished Spartan general and diplomatist, who, with the aid of the Persians, succeeded in finally overthrowing the naval supremacy of the Athenians. His first success was the defeat of the Athenian fleet at Notium in 407 B.C. By his victory at Ægos Potami in 405 he brought the Peloponnesian War to a close. This blow was followed by the capture of Athens (404), where he set up the Thirty Tyrants. He lost much of his power after the accession of the Spartan king, Agesilaus (397), and was endeavouring to effect a change in the constitution, by which the monarchy would have become elective, when he was slain in the battle of Haliartus.

Lysias (458-378 B.C.), an Attic orator, was born at Athens. In 443 he accompanied a party of Athenian colonists to Thurii in south Italy. Thirty years later he was expelled by the Spartan faction, and returned to Athens (411). He escaped death at the hands of the Thirty Tyrants by fleeing to Megara (404), and was one of the patriotic band who aided Thrasybulus in driving them out. The remainder of his life was passed at Athens, where he occupied himself with composing speeches for delivery in the law-courts.

Lyttelton, RIGHT HON. ALFRED, b. 1857, son of the fourth Baron Lyttelton. He was educated at Eton and Cambridge, where he gained a great reputation as a cricketer. Called to the bar in 1881, he was made Recorder of Hereford (1893-4), and of Oxford 1894. In 1903, on the resignation of Mr. Chamberlain, he was appointed Colonial Secretary, and held office till 1905.

Lyttelton, GEORGE, LORD (1709-73), entered Parliament in 1730, became Chancellor of the Exchequer in 1755, and was raised to the peerage in 1757. His works include *Observations on the Conversion of St. Paul* (1747), *Dialogues of the Dead* (1760), a *History of Henry II.* (1764).

Lytton, EDWARD LYTTON BULWER-LYTTON, LORD (1803-73), man of letters and politician, was the youngest son of General Earle Bulwer of Heydon Hall, Norfolk, and Elizabeth Barbara, daughter of Richard Lytton, of Knebworth, Hertfordshire. He was born in London and educated at Cambridge, where he won the Chancellor's Medal. His public career began with his entry into Parliament as member for St. Ives (1831), a seat which he soon exchanged for Lincoln (1832-41). He supported the Whigs on most questions, and in 1838 earned a baronetcy by his brilliant pamphlet called *A Letter on the Crisis*. He was Conservative member for Hertfordshire from 1852 to 1866, when he was raised to the peerage. Whilst Secretary for the Colonies under Lord Derby (1858-59) he formed the colony of British Columbia and separated Queensland from New South Wales. He acquired more or less distinction as a novelist, poet, essayist, playwright, and satirist. It is on his novels that his reputation chiefly rests. They cover a wide field, from studies of the ancient world like *The Last Days of Pompeii* and romances on mediæval subjects such as *The Last of the Barons*, to tales of mystery of the type of *Zanoni*, and the numerous novels which deal with modern, especially fashionable, life. His satire *The New Timon* (1845) contains some graphic portraits of contemporary statesmen and a fierce attack, which did not remain unpunished, on Tennyson. His most successful plays were the *Lady of Lyons* and *Richelieu* (1838).

Lytton, EDWARD ROBERT, EARL OF (1831-92), son of the novelist, was educated at Harrow, and entered the diplomatic service in 1849. After holding the post of secretary of legation at various

European capitals, including Vienna (1869-72) and Paris (1872-74), he was appointed minister to Lisbon in 1874. He was Viceroy of India from 1876 to 1880, and in 1887 was sent as ambassador to Paris. His chief literary productions, published under the pseudonym of "Owen Meredith," were *Lucile, a Poem* (1860), *The Ring of Amasis*, a prose romance (1863), *Orval*, a poem (1869), and *Glenaveril*, a poem (1885). He also wrote a life of his father.

M.

M, the 13th letter of the alphabet, was developed by the Phœnicians from the hieroglyphic symbol representing an owl. M is the labial nasal, related to *b* and *p* as *n* is to *d* and *t*. It frequently interchanges with *n*; cf. *tempt* from Latin *tentare* with *count* from Latin *comitem*. It may also become *b*, as in *marble* from Low Latin *marmorem*. It has disappeared in some words, as in *five* (Gothic *fimf*.)

Mab, an important personage in the realm of faëry, some of whose functions are enumerated in *Romeo and Juliet* (i. 4). The Queen Mab of sixteenth- and seventeenth-century literature differs widely from Shelley's Queen Mab.

Maba, the dominant people in the kingdom of Waday, Central Sudan, whose territory lies in the north and north-east; there are over twenty tribal divisions, including the royal and noble Kodoy, Uled Jemma, Malanga, Madala, and Matlamba tribes, all united by their common Negro speech, history, traditions, and physical appearance. They are a rude, Negroid people, evidently crossed with Arab blood, and the reigning family even claims descent through the female line from a branch of the Arab dynasty of the Abbasides. Nearly all have long been Mohammedans, and whatever culture they possess is entirely due to Arab influences. From the great preponderance of this nation Waday is sometimes called Dar-Maba, "Mabaland." (Nachtigal, *Sahra und Sudan*, ii.)

Mabiha (MAVIA), a people of East Central Africa, who occupy the lower course of the Rovuma, but are cut off from the coast by the intervening Makuas and Matambwes. They are scattered over their rugged plateaus, not in villages, but in family groups of one or two huts. Both sexes wear the *pelele*, a wooden disk or ring two inches in diameter, inserted in the upper lip, to which it gives the form of a duck's bill. In other respects the Mabiha greatly resemble the neighbouring Makondes, to whom Consul O'Neill affiliates them. (*Proceedings of the Royal Geographical Society*, 1883.)

Mabillon, JOHN (1632-1707), a French writer on ecclesiastical biography, antiquities, etc., and on diplomacy, was born in Champagne, studied at the abbey of Saint Remy, became a Benedictine monk in 1654, and was ordained priest in 1660. After helping to edit St. Bernard's works, he began to write the *Acta Sanctorum Ordinis S. Benedicti*, in nine volumes (1668-1702), followed up (1701-7)

by four volumes of *Annales Ordinis S. Benedicti*. In 1681 he produced his treatise *De Re Diplomatica*, Lib. VI., after which King Louis XIV. commissioned him to collect, in Italy, books and MSS. for the royal library. Mabillon lived many years and died at St. Germain des Prés.

Mably, GABRIEL BONNOT DE (1709-85), a distinguished French writer on politics and history, was born at Grenoble, and educated by the Jesuits at Lyons, but early abandoned theology for ancient history. Upon the issue of his *Parallèle des Romains et des Français* (1740) the Abbé Mably entered the service of Cardinal de Tencin, and in 1743 concluded a secret treaty with Prussia, while in 1746 he prepared the instructions of the French representative at the Congress of Breda. Mably soon after this quarrelled with his patron, and, retiring into private life, again occupied himself with history, his most valuable work being *Observations sur l'Histoire de France*.

Mabuse, or MAUBEUGE, JEAN DE, or JAN GOSSART (1480?-1562), a distinguished Flemish artist, born at Maubeuge, a village of Hainault, appears to have studied on the French border. He then went to Antwerp, and in 1508 went to Italy with his patron, Philip of Burgundy, where he studied the Leonardesque school. He introduced a new style into the Flemish school. He resided chiefly at Middleburg, where fine specimens of his art are preserved. He executed commissions for Charles V. and for Christian II. of Denmark, the portraits of whose children came into the possession of Henry VIII., and are now at Hampton Court. He is said to have visited England.

Macadam, JOHN LOUDON (1756-1836), inventor of the method of paving roads with layers of small pieces of hard stone, was born at Ayr, and, having lost his father, went at the age of fourteen years to an uncle in New York. During the American War of Independence he made a fortune, but at the end of the war returned to Scotland almost destitute. In 1782 he undertook to victual the navy in the western ports of England, and resided first at Falmouth and then at Bristol, where in 1815 he was appointed surveyor of roads and put in practice his scheme for improved road-making. The House of Commons eventually repaid his outlay, and gave him an honorarium of £2,000 for his invention. He died at Moffat.

Macaque, any monkey of the genus *Macacus*, with numerous species from India, Ceylon, and south-eastern Asia; one from Europe [BARBARY APE]; one, the Tcheli Monkey (*M. tcheliensis*), with thick woolly fur from Manchuria; and one, the Japanese Ape (*M. speciosus*), from Japan, the most northerly habitat of any living monkey. The last two specimens are exhibited in cages outside the monkey house in the Zoological Gardens, Regent's Park.

Macaroni, a dandy, originally a member of the Macaroni Club established in London about the middle of the 18th century. Its founders had travelled in Italy, and introduced Italian macaroni

into England; hence their name. They wore long curls and "spying-glasses," and were much given to drinking, gambling, and other fashionable vices. The Italian macaroni is wheaten paste, forced by great pressure into a pipe-like form.

Macartney, GEORGE, EARL (1737-1806), born in Ireland, and educated at Trinity College, Dublin, studied law at the Temple. He was appointed envoy-extraordinary to Russia in 1764, and then became secretary to the Lord-Lieutenant of Ireland and K.C.B. Being appointed governor of the Caribbean Isles, Grenada, etc., on the capture of Grenada by the French he was sent as a prisoner to France. On his release he was made an Irish peer and governor of Madras. In 1792 he conducted our first embassy to China with distinguished tact and success. He gained his British earldom after a confidential mission to Italy in 1796, and in the same year became governor of the Cape of Good Hope, but retired from ill-health in 1798.

Macassar Oil, a vegetable oil obtained from Macassar, has a grey colour and peculiar odour. The hair-oil so called consists of a mixture of oils, chiefly olive oil, coloured and perfumed.

Macaulay, THOMAS BABINGTON, LORD (1800-59), politician, essayist, and historian, born at Rothley Temple, Leicestershire, was son of ZACHARY MACAULAY, a prominent member of the "Clapham Sect" (q.v.), who was governor of Sierra Leone from 1792-9. His son Thomas spent his early years at Clapham, and in 1818 entered Trinity College, Cambridge, where he obtained a fellowship. He began his literary career early, being a contributor to Knight's *Quarterly Magazine* and to the *Edinburgh Review* before he was called to the bar (1826). In 1830 he entered Parliament as Lord Lansdowne's nominee for Calne. He at once distinguished himself, especially as an advocate of the abolition of slavery and of reform. The African trading firm of Babington and Macaulay (his father) having failed, he was glad to accept the position of member of the Supreme Council of India in 1832. His sister Hannah, afterwards Lady Trevelyan, accompanied him to India, where he greatly distinguished himself as president of the commission for drawing up a code of jurisprudence. In 1838 he returned to England, having saved a fair fortune, and again entered Parliament, as member for Edinburgh. He was Secretary for War from 1839 to 1841, and in 1847 became paymaster of the forces. In 1842 he published the *Lays of Ancient Rome*. In 1848 appeared the first two volumes of his *History of England*, beginning at the accession of James II. Two more volumes, reaching to the Peace of Ryswick (1697), appeared in 1855, when it was evident that failing health would prevent the prosecution of his design even to the end of Queen Anne's reign; but the splendid fragment, with all its faults, achieved an unrivalled success and enriched the author. He was raised to the peerage in 1857, and died at Kensington, never having married. His *Life* by his nephew, Sir George Trevelyan, is one of our best biographies. His *Essays* and the *Lives* originally written for the *Encyclopædia Britannica* are of lasting interest and value.

Macaw, a popular name for New World parrots, generally of brilliant coloration, with the upper mandible greatly curved over the lower, and the tail long and wedge-shaped.

Macbeth, King of Scotland from 1040-59, son of Finnleach, slew his predecessor Duncan near Elgin, and apparently usurped the throne, having been Lord of Moray. His wife's name was Gruoch. In 1054 Duncan's sons (who had taken refuge with their uncle Siward, Earl of Northumberland) invaded Scotland, and fought an indecisive battle at Dunsinane; but three years afterwards Macbeth fell at Lumphanan, in Aberdeenshire, and, in spite of the efforts of his stepson, was succeeded by Malcolm, son of Duncan. Macbeth is said to have visited Rome. Shakespeare's version of his history is mostly fanciful.

Maccabæus. [MACCABEES.]

Maccabees, the name of a dynasty of Jewish kings, so called from the surname, Maccabæus, of JUDAS, son of MATTATHIAS (d. B.C. 166), who, with his brothers SIMON and JONATHAN, delivered Judæa from the oppression of the Syrians under Antiochus IV. The three hero-brothers successively held the office of high priest, and Simon was made king. He made an alliance with the Romans, and in B.C. 135 was succeeded by his son, John Hyrcanus, who extended the kingdom. His son, Judas Aristobulus, succeeded in B.C. 105, but died in the next year, when his brother, Alexander Jannæus, became king, and increased the power and glory of the nation, which, however, suffered from the dissensions of the Pharisees, Sadducees, and Essenes—sects which arose during Hyrcanus' reign. Alexander died in 78, and on the death of his queen Salome Alexandra, their sons, Hyrcanus and Aristobulus, disputed the succession, with the result that Pompey conquered Judæa, did away with the royal dignity, and established Hyrcanus II. as high priest. Herod, son of Antipater of Idumæa, expelled Aristobulus' son Antigonus, and put to death (B.C. 35) his grandson Aristobulus III., whose sister Mariamne he married. The Maccabees are also called Asmonæans. The history of the brothers is given in two apocryphal books of the Old Testament, which the Council of Trent adopted as canonical.

MacClellan, GEORGE BRINTON (1826-85), an American general, was born at Philadelphia, and trained at the West Point military school. He served in the Mexican War and the Red River expedition, and on the outbreak of civil war succeeded McDowell after the battle of Bull's Run, and became commander-in-chief (1861). He then commanded the army of the Potomac. Later he compelled Lee to retire from Maryland by the battles of South Mountain and Antietam (September 14-17, 1862); but owing to his apparent indolence he was relieved of his command and retired from the army. In 1864 he was the Democratic nominee for the presidency, but was defeated by Abraham Lincoln. In later life he was superintendent of a railway.

Macclesfield, a manufacturing town and formerly a parliamentary borough (returning two members), of the county of Cheshire, on the river

Bolton, 16 miles S.E. of Manchester. The principal manufacture used to be silk, but its trade and population have dwindled since 1850. The church of St. Michael and the guildhall are fine buildings. Pop. (1901), 34,635.

M'Clure, SIR ROBERT JOHN LE MESURIER, born in 1807, entered the navy in 1824. In 1850, as a commander, he took charge of the *Investigator* in the search for Sir John Franklin. During four years of absence he discovered and completed the North-West Passage. Captain M'Clure was rescued by an expedition under Captain Belcher, and, returning to England, was posted, knighted, and rewarded with £5,000. In 1859 he was made a C.B., subsequently commanded the *Esk*, 21, in China, and, becoming a rear-admiral in 1867, died a vice-admiral in 1873. [NORTH-WEST PASSAGE.]

McCulloch, JOHN, M.D., F.R.S., F.G.S. (1773-1835), geologist, mineralogist, chemist, and physician, member of a good Scotch family of Cardoness, Kirkcudbrightshire, was born in Guernsey, taught at Plympton, Penzance, and Lostwithiel; studied medicine in Edinburgh, and gained his diploma in 1791. In 1795 he became assistant-surgeon in the Artillery, and in 1803 he was appointed chemist to the Ordnance. From 1807 to 1811 he practised as physician at Blackheath, after which he was employed until 1832 in various mineralogical and geological surveys of Scotland. He then became lecturer in chemistry and geology in the East India Company's military college at Addiscombe. He died in consequence of a carriage accident very soon after his marriage. Dr. McCulloch published four large geological works, two medical works, and a *Treatise on the Art of Making Wines* (1821).

Macdonald, ALEXANDER (ALASDAIR MACMHAIGHOUR ALASDAIR) (1700-80), was the son of a clergyman. He was intended for the Church or the bar, and for this purpose attended Glasgow University for some terms. When still young he married, and then wandered about for some years teaching and catechising under the patronage of the Society for Propagating Christian Knowledge. Later on he became a Roman Catholic and an avowed supporter of the Chevalier. He held a commission in the Highland army (1745), and helped by his songs and addresses to rouse the clans. After the battle of Culloden he kept in hiding for some time, and then settled on a farm in Weigneig, where he published his poems (1751) under the title *Ais-eiridh na Seam Chanoin Albannaich*. This caused his expulsion from his farm, and he went to Arisaig, where he died.

Macdonald, SIR ARCHIBALD (1747-1826), judge, was born at Armidale Castle, in the Isle of Skye. He was educated at Westminster school and at Christ Church, Oxford, graduating in 1768, he became a student at Lincoln's Inn in 1765, and was called to the bar in 1770. In 1778 he was made a king's counsel, and in 1780 was one of the justices of the grand sessions in Wales. In 1784 he became Solicitor-General under Pitt. He was knighted June 27, 1788, and next day was made Attorney-General. He became member for Hindon

in Wiltshire in 1777, and in 1779 made a violent attack on Lord North, for which he afterwards apologised. In 1793 he became Lord Chief Baron of the Exchequer, and, after serving for twenty years on the bench, retired (1813) and was made a baronet.

Macdonald, ÉTIENNE JACQUES, MARSHAL (1765-1840), was born in France, of a Scotch family which had settled there. He fought for the Revolution, and distinguished himself at Jemappes; but his most famous exploits were those undertaken on behalf of Napoleon. He defeated Suwaroff at Trebbia (1799), and in 1801 marched across the Splügen Pass. He was present at Wagram, Lutzen, and Bautzen, but was defeated at the Katzbach. He was made a peer by the Bourbons. From 1816 he attended the discussions in the Chamber of Peers.

Macdonald, JOHN (1769-1831), a military engineer, was the youngest son of Flora Macdonald, the Jacobite heroine. He was educated in Portree and Edinburgh, and in 1780 obtained an Indian cadetship. For about eight years he was military and civil engineer in Sumatra, becoming first lieutenant in 1794. He made many maps and charts of Sumatra, which are now in the British Museum, and made observations on the variation of the magnetic needle. In 1800 he retired on half-pay, and held various posts till he became field officer of the Cinque Ports Volunteers, when he made a reconnaissance in an open boat of the preparations for invasion at Boulogne. His engineering skill was best shown in his improvements of naval and military telegraphy. Macdonald became an F.R.S. in 1800. His writings include many translations and other works, among which are *Experiments with Machine-driven Fuses for Time Signals* (1819), *A New System of Telegraphy* (1817).

Macdonald, SIR JOHN ALEXANDER (1815-92), was born in Scotland, but when still quite young was taken to Canada, and there educated at Kingston. He was admitted to the bar in 1836, and nine years later became member of Parliament for Kingston. He held numerous posts, being a member of the Executive Council, receiver-general, commissioner of Crown lands and Attorney-General, and in 1869 became Premier, which post he held till 1873, when he resigned owing to the Pacific Railway scandal, but resumed office in 1878. He was the recognised leader of the Conservatives from 1873, and took an active share in promoting the Canadian Pacific Railway and the Canadian federation movement. He was made a Privy Councillor in 1872, K.C.B. 1867, G.C.B. 1884.

Mace. 1. A symbol of authority, consisting of a staff about 5 ft. in length, to which is attached a heavy metal head. The mace was originally a weapon of attack, and was used as such during the Middle Ages; the head was usually surrounded with spikes, which disappeared when it was adapted to more peaceful purposes. The mace laid on the table of the House of Commons and those belonging to the City Corporations are symbols of the joint authority of these bodies. As a badge of office, with much the same signification, it is borne in front of

the Lord Mayor and the Vice-Chancellors of the two universities.

2. The aril or fleshy outgrowth over the seed of the nutmeg (q.v.). It is of a net-like form and, when fresh, of a scarlet colour, serving to attract frugivorous birds; but, when dry, is brown. It is imported in cases weighing from 60 to 120 lbs. and forms a cheap spice. It contains about $4\frac{1}{2}$ per cent. of an aromatic oil; but the oil of mace of commerce is prepared from small unsaleable nutmegs.

Macedonia, ancient name of part of northern Greece. The Macedonia of Herodotus was bounded on the east by the river Lydias and the Thermæan Gulf, on the south by Thessaly, on the west by Mount Pindus, and on the north by Mount Lyncestus. Philip's kingdom originally extended to the Strymon on the east, but did not include the Thracian Chersonese. He added that Chersonese and the district between the rivers Strymon and Nestus, Pæonia on the north, and on the west part of Illyria as far as Lake Lychnitis and the river Drilo. Under Alexander Macedonia became the most powerful state in the world. The Roman province of Macedonia (B.C. 166) included Illyria and Thessaly and Thrace as far towards the east as the river Hebrus (Maritza).

Macfarren, SIR GEORGE ALEXANDER, (1813-87), a prominent musical composer, was born in London. He was educated at the Royal Academy of Music, where he became a professor in 1834. In 1875 he was made principal of the Academy, and professor of music at Cambridge, and in 1883 he was knighted. His most celebrated works are *The Devil's Opera* (1838), *Robin Hood* (1860), *Don Quixote* (1846), his oratorios *St. John the Baptist* (1873), *The Resurrection* (1876), *Joseph* (1877). He wrote many musical treatises. For several years he was blind, but the affliction did not seem to affect his work.

McGillicuddy's Reeks, a range of the Kerry Mountains, in Ireland, south of Dingle Bay, one peak of which, Carran Tual, has the highest elevation in Ireland, namely 3,414 ft.

Machærodus, the "sabre-toothed tigers," are a genus of extinct Carnivora remarkable for the enormous development of their canine teeth, and also for a wide distribution both in time and space. They occur in the Miocene beds of the Val d'Arno, Italy, of Auvergne and of Eppelsheim; in the sandstones of the Sivalik Hills (q.v.), India; in Pampas deposits and bone-caves of South America; in the Cromer Forest-bed and, apparently associated with human remains, in Kent's Cavern (q.v.), Torquay.

Machiavelli, NICCOLO (1469-1527), diplomatist, historian, and poet, was born at Florence of a noble family. He became at an early age Chancellor, and then State Secretary, of the Florentine republic, and conducted several important embassies with signal address. Louis XII. insisted on a council being held at Pisa, which induced Pope Julius II. to unite with Ferdinand of Aragon in restoring the Medici (1513); whereupon Lorenzo de' Medici deprived Machiavelli of his civic dignities, and soon after, Lorenzo's uncle, Cardinal

Giovanni de' Medici, had him banished after imprisonment and torture, but on his elevation to the Papacy as Leo X. (1514) the banishment was annulled. Machiavelli returned, and wrote his famous treatise on government, *Il Principe* (*The Prince*), dedicating it to Lorenzo, whereupon he was received into favour by the Medici, and under Clement VII. (cousin of Leo X.), after an interval of suspicion and disfavour, was employed in the service of the state; but, after all, on his return from the defence of Tuscany against Charles V. he fell into neglect, and died in poverty. *The Prince* has been generally misunderstood and condemned, so that the author's name has become a byword for unscrupulous and criminal policy; but its immorality is that of Italy in the 15th century; and, if Lorenzo was advised to gain and keep power by treachery, oppression, and even crime, he was to use it for the union and freedom of Italy, and for beneficent purposes generally. The best of Machiavelli's comedies, *The Mandragola*, is, in spite of an unsavoury subject, full of humour, and shows that he thoroughly understood the dramatic art. His *History of Florence* (in eight books) from 1215 to 1492 is a work of the highest merit and value, and he is said to have left materials for its completion to Guicciardini. In his *Discourses on the First Ten Books of Livy* (composed before *The Prince*) he treats of the conditions requisite for the maintenance of a republic and of the crises which make for its downfall. Sir Henry Maine ascribes to him a large share in forming the modern conception of the State.

Machins, a people of East Turkestan, occupying the oases south and south-west of the Tarim basin, as well as the Keriya Mountains bordering this depression on the south. The Machins regard themselves as the true aborigines of East Turkestan, though the highlanders alone (Malchas) have preserved the primitive type: large cheek-bones, skull angular and flattened at occiput, rather thick lips, dark brown complexion, eyes generally black, but also blue or grey, hair also black, chestnut, and even reddish, pointing at mixed Mongolic and Caucasian descent, probably from the *Ussuns*, *Sakas* and *Tukharas*, who, according to the Chinese records, occupied this region long before the Christian era. They are nominal Mohammedans, though still addicted to polyandry as well as polygamy and practising many pagan rites; speech a Turki dialect (Prejevalski).

Mack, KARL VON (1752-1828), an Austrian general who rose from the ranks, becoming a captain in the war with Turkey. He was recommended by Laudon to the emperor. In 1793 he was quarter-master-general, and in 1797 commanded the Army of the Rhine. The next year he was defeated by the French near Naples, fled to their camp and was sent as prisoner to Dijon. Yet in 1804 the emperor trusted him with a chief command, which resulted in the historic capitulation of Ulm, when Napoleon took 28,000 Austrian prisoners. Mack was tried for treason and condemned to death, but his sentence was commuted and he was after a time released from prison.

Mackay, CHARLES, LL.D. (1814–1889), songwriter and journalist, was born at Perth, and educated at the Caledonia Asylum, London, and in Brussels. From 1835 to 1844 he was assistant sub-editor to the *Morning Chronicle*, and then became editor of the *Glasgow Argus*. He was afterwards on the staff of the *Illustrated London News* and the *Times*. He is best known for his popular songs, many of which were set to music by Sir Henry Bishop.

Mackenzie, SIR ALEXANDER, an explorer of N. America, born in Scotland, emigrated to Canada where he entered the service of the North-West Fur Company. His energy caused him to be appointed in 1789 to explore the tract north-west of Lake Athabasca. He then discovered and traced the Mackenzie river. In 1792 and 1793 he traversed the unknown regions between Upper Canada and the Pacific, encountering most serious hardships and dangers. He was knighted shortly after the account of his travels appeared in 1801.

Mackenzie, SIR GEORGE (1636–91), born at Dundee, a cadet of the family of the Earl of Sleaforth, showed great precocity in classical and other studies. He became an advocate in 1659, and in 1661 defended the Marquis of Argyll on his trial for high treason. Before the Restoration he published several moral essays and a poem, *Celia's Country House and Closet*. Soon after the Restoration he was appointed justice deputy, or assistant chief-justice. In 1669, as representative of the county of Ross, he delivered a fine speech against the union between England and Scotland. In 1677 he became king's advocate, and earned infamy in that capacity as a cruel instrument of oppression. In 1686 he lost his office for opposing the efforts of James II. to restore the Roman Catholic ascendancy, but regained it in 1688. At the time of the Revolution his public life ceased; after founding the Advocate's Library, Edinburgh, he retired to Oxford. He died at St. James's.

Mackenzie, HENRY (1745–1831), born and educated in Edinburgh, son of a physician in good practice; followed the legal profession, studied exchequer practice, and became partner and then successor to Mr. Inglis as attorney to the Crown, notwithstanding his early fondness for literature. In 1771 he published *The Man of Feeling* anonymously, the success of which induced a Mr. Eccles to claim the authorship and forge the manuscript of the whole novel. Subsequently *The Man of the World* and *Julia de Roubigné* were produced, the three novels forming a series connected by the relation of their respective aims. He also edited the essays of the Mirror Club, formed about 1778 by young men of letters, most of whom were connected with the Scottish bar, under the titles of the *Mirror* and *Lounger*. He also published two tragedies and two comedies, and many papers, some of which were read before the Royal Society of Edinburgh. In 1804 he was made Comptroller of Taxes for Scotland.

Mackerel, a general name for fish of the Acanthopterygian family Scombridæ, which includes many valuable food-fishes. The species are

abundant in all tropical and temperate seas. The elongated, generally spindle-shaped body is naked or covered with small scales; two dorsal fins and, usually, finlets are present. They are extremely active, and wander in large shoals, approaching the coast periodically, probably in pursuit of the smaller fishes on which they feed. The type-genus *Scomber*, with seven species, has nearly the range of the family, but is absent from the eastern shores of South America. The body is covered with small scales, and there are finlets behind the dorsal and anal fins. *S. scomber*, the Common Mackerel, ranges over the north Atlantic Ocean and the North Sea. It is a very valuable food fish, of an average length of about fifteen inches, shapely in form, and beautiful in coloration. The upper surface is greenish-blue, with vertical black bars; below the hue is silvery white. The British mackerel-fishery is an important industry. The first shoals appear early in the year, and about the end of May, when the fish are in the best condition immense numbers are met off the Scilly Isles. The bulk of these come up Channel, but some go northwards into the Irish Sea. Nets are chiefly used in their capture, but very many are taken with lines baited with anything bright. They spawn at some distance from land, and the eggs float on the surface. *S. colias*, the Spanish Mackerel, sometimes taken on the Cornish coast, is spotted on the sides, and differs from the Common Mackerel in having a swim-bladder. [HORSE-MACKEREL, ROCKLING, SCAD, TUNNY.]

Mackintosh, SIR JAMES (1765–1832), jurist, publicist, historian, and philosopher, was born at Dorish, Inverness-shire, educated at Fortrose, Ross-shire, and King's College, Aberdeen, and received a medical degree in 1787 after three years' study at Edinburgh. In 1792 he published *Vindiciæ Gallicæ*, an answer to Burke's *Reflections on the French Revolution*, and thereby became famous. About this time he entered Lincoln's Inn, and was soon called to the English bar. He defended Peltier when he stood his trial for libelling the First Consul of France (Bonaparte), and soon after was appointed Recorder of Bombay. From this post he retired in 1811 with a pension of £1,200 per annum. He entered Parliament in 1813 as member for Nairn county, and from 1818 sat as member for Knaresborough. He was made a Privy Councillor in 1828, and in 1830 a commissioner for Indian affairs in Earl Grey's Administration. His incomplete *History of the British Revolution* was published in 1834. He was a contributor to the *Edinburgh Review*, and wrote an important work on ethics.

Macklin, CHARLES (1690–1797), actor, dramatist, and centenarian, began life as a Dublin bargeman, but went to England with a company of strolling actors of comedy in 1711. In 1716 he appeared in London, and in 1741 became famous as Shylock. He retired from the stage in 1789. His comedies, *The Man of the World* and *Love à la Mode*, are full of humour.

Mackonochie, ALEXANDER HERIOT (1825–87), born at Fareham, in Hampshire, educated

at Bath, Exeter, and Wadham College, Oxford, graduated in 1848, and was ordained the next year. He was curate at Westbury in Wiltshire, and Wantage, in 1858 went to St. George's-in-the-East, and in 1862 became curate-in-charge of St. Alban's, Holborn. From 1867 to 1882 he was frequently prosecuted for alleged excesses in ritual, and in 1882 he resigned his cure to oblige his bishop. When staying at Ballachulish he lost his way in the forest of Mamore, and died from exposure.

MacLaurin, JOHN (1698-1746), born at Kilmoddan, took his M.A. degree at Glasgow at the age of fifteen, and when only nineteen was elected professor in the Marischal College, Aberdeen. In 1725 he became professor of mathematics in Edinburgh University. Of his mathematical works the most famous is his *Treatise on Fluxions* (1742).

Macleod, DR. NORMAN (1812-72), a Scottish divine, was born at Campbeltown, Argyshire. He was educated at Glasgow, Edinburgh, and in Germany. He was minister, first at London, then at Dalkeith (where he published *The Earnest Student* (1854), and became editor of the *Edinburgh Christian Magazine*), and eventually, in 1851, of Barony Parish, Glasgow. In 1854 he became one of the chaplains to the Queen, and Dean of the Order of the Thistle, and in 1858 received an honorary degree of D.D. He became editor of *Good Words* in 1860. In 1867 he visited the mission stations of India, and on his return published *Peeps at the Far East*.

MacLise, DANIEL, R.A. (1806-70), a distinguished painter, was born at Cork. His drawing attracted attention at school, and in 1820 he gave up a situation and took to art. In 1825 he made a successful drawing of Sir Walter Scott. He then opened a studio, and eventually became a student of the Royal Academy in 1829. In 1833 he became famous by his *All Hallow Eve*. He was elected associate (1836) and member (1840) of the Royal Academy. He painted the frescoes in the Royal Gallery of the House of Lords.

MacMahon, MARIE EDMÉ PATRICK MAURICE DE (1808-93), Duke of Magenta and Marshal of France, was educated at the military college of St. Cyr. He distinguished himself in Algeria, and became brigadier-general in 1848. During the Crimean War he was in command of a division, and assisted in storming the Malakoff. He took part in the Austrian campaign, and won the battle of Magenta, and then became Governor-General of Algeria. During the Franco-German War MacMahon commanded the First Army Corps, and was defeated at Weissenburg and Wörth. Then whilst trying to relieve Metz he was forced to capitulate at Sedan, where he was severely wounded. In 1873 he was elected President of the French Republic, but resigned in 1879 after the failure of the anti-Republican reactionaries, whose tool he was.

Macon, a town of France, in the department of the Saône-et-Loire, 33 miles south of Chalons, on the right bank of the Saône. The streets are narrow, but it contains some fine modern public buildings, and has an extensive quay. The old

ramparts are laid out as promenades. It is noted for its wines.

Macpherson, JAMES (1738-96), born in Inverness-shire, published *Remains of Ancient Poetry* translated from Gaelic or Erse. Being commissioned to collect more materials of the kind, he composed two volumes of prose poems, which he asserted to be translations of Gaelic poems by Ossian, son of Fingal, a bard who flourished about A.D. 300. These poems raised a hot controversy, and were much admired even by those who detected the imposture. They were based on bardic ballads and traditions. He became agent to the Nabob of Arcot, and sat in the House of Commons 1780 to 1790.

Macready, WILLIAM CHARLES (1793-1873), was born in London. His father, lessee and manager of several provincial theatres, sent him to Rugby and Oxford, intending him for the bar, but from lack of funds he had to join his father's company in Birmingham (1810). In 1816 he appeared in Covent Garden, and played with success in America in 1826, and in Paris in 1828. He became manager of Covent Garden in 1837, and of Drury Lane 1842, but, owing to his losses, had to give up. He revisited America from 1849 to 1851.

Macrura, a group of Crustaceans (order *Decapoda*) containing the lobster, shrimp, prawn, etc. The abdomen is covered with a hard shell.

Madagascar, the name of a large island in the Indian Ocean, 230 miles from the east coast of Africa. The inhabitants, called Malagasy (q.v.), form a single race, but are divided up into tribes. The capital is Antananarivo. In 1820, during the reign of Radama I., Christian missionaries began to teach, but in 1828 his wife Ranavalona closed the island to Europeans and persecuted the Christians. Her son, Radama II., reopened the island and freed the slaves. The principal exports are cattle, hides, indiarubber, rice, and valuable woods. In 1896 it was declared a French colony.

Madder Red, a dyestuff obtained from the madder plant, *Rubia tinctorum*. The dye is obtained from the roots, and the quality varies greatly with the age of the plant and with the climatic conditions of the country where grown. The roots are either sun or kiln-dried, threshed to remove the outer skin, cut and ground in stone mills. Frequently, however, the last process is omitted, and the dyestuff sold as the cut pieces. The chief constituent of the root of importance in dyeing is *alizarin* (q.v.), but a large number of other compounds are also present. Though formerly immense quantities of this substance were employed in the dyeing industry for the production of Turkey red, obtained chiefly from France, Germany, Italy, and Turkey, yet of late years the artificially-prepared alizarin has almost entirely replaced the natural substance.

Madeira. 1. An elevated island off the west coast of Africa, belonging to Portugal, long. 17° W., lat. 32° 30' N. It is surrounded by lofty cliffs broken by a few bays in which fertile valleys terminate, and

is a well-known resort for sufferers from consumption. The capital is Funchal. The principal produce used to be the rich and delicately-flavoured wine which bore its name, but the vines were almost exterminated by oïdium (q.v.); their culture is reviving, but now cochineal and sugar are largely substituted.

2. A large river of South America, a tributary of the Amazon. It rises in the mountains of Chuquisaca (Peru), and has a course of 1,100 miles; but the name Madeira only applies to the lower part, which flows to the north-east into the Amazon. It is named from the quantity of timber (*Madeira*) carried down by the stream.

Madi. 1. A people of East Sudan on both banks of the White Nile below Lake Albert Nyanza; the Egyptian station of Duffi was in the territory of the Madi, who greatly resemble their Lur and Shuli neighbours both in appearance, usages, and their fantastic style of head-dress. But the language is quite distinct and, according to Emin Pasha (*Letters*), is related to that of the Zandebs (Niam-Niam). 2. A Negro tribe occupying the right (north) bank of the Welle about lat. 3° 40' N.; probably akin to the Mombuttus (Junker, *Travels*, ii.). 3. A low caste people of the Bustar district, left bank of the Godavery, British India; Gonds of Dravidian speech; pagans.

Madison, JAMES (1758?-1836), born in Virginia, studied for the bar, obtained a public office when about twenty-two years old, and was early elected to Congress. He soon became distinguished for eloquence, and contributed effectively to the drafting of the Constitution. He became Secretary of State under Jefferson, and in 1809 was elected President. He strongly resented the celebrated Orders in Council and the outrages inflicted on American shipping and seamen. Madison's policy and British obstinacy led to war with England in 1812, in which America had a fair and unexpected share of success, though her commerce suffered seriously, and in 1814 Great Britain was glad to make peace. Madison, at the end of his second term, in 1817, retired into private life.

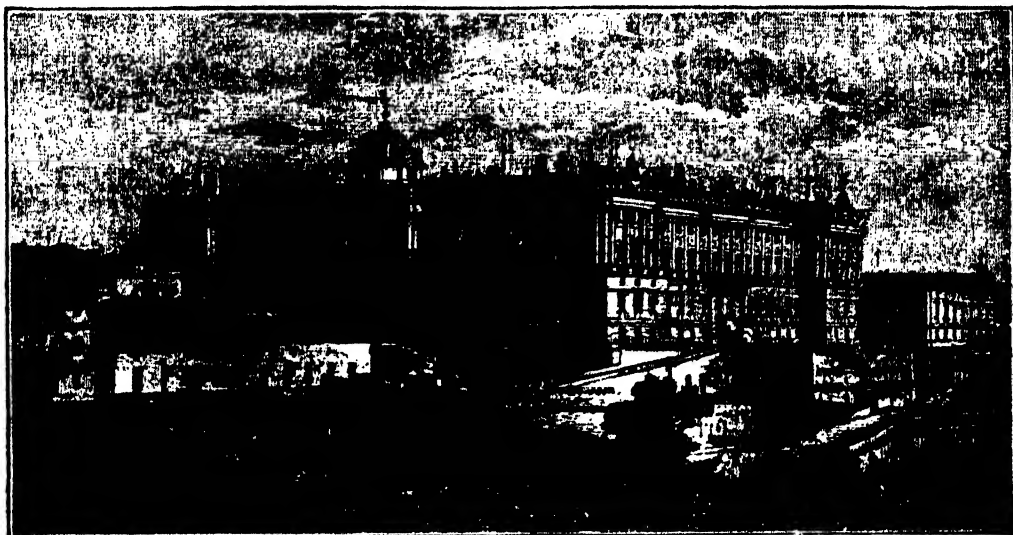
Madness. [INSANITY.]

Madoc, a prince of Welsh tradition, who in the 12th century sailed with ten ships and three hundred men far to the west and discovered land. Some detect traces of these voyagers in America.

Madras, PRESIDENCY OF, the southern portion of the British possessions in India, comprising most of the territories south of the Krishna. Part of it is governed by dependent princes, the rest by the governor of Madras. Area, 149,092 square miles. **MADRAS, CITY OF**, capital of the Presidency,

a very large city on the east (Coromandel) coast, lat. 13° 5' N., long. 80° 21' E. The Black Town is inhabited chiefly by Hindoos and Indian Mohammedans, crowded about Fort St. George in narrow, dirty streets. The Europeans of the better class occupy detached houses in the suburbs. It has no proper harbour.

Madrid, the capital of Spain and of New Castile, lies at a height of 2,060 ft. above the sea on the river Manzanares, lat. 40° 25' N., long. 3° 28' W. It is a large city, the older portions being badly built,



THE ROYAL PALACE, MADRID.

Frith & Co., Reigate, phot.

with narrow, tortuous streets. There are two palaces, the Palacio Real at the western end of the oblong which the city forms, the Buen Retiro at the eastern end, where is also the *Prado*, or great park. The principal square is very handsome, and is surrounded by a piazza. There are many fine streets with lofty, well-built houses.

Madrigal, a short lyrical poem, generally of an amorous character. Petrarch and Tasso in Italy, and Lodge, Carew, and Suckling in England, are named amongst the poets who excelled in this branch of the art. In *music* the term denotes a song of elaborate character, but without instrumental accompaniment, written in five or six parts. The musical madrigal arose in Flanders in the 15th century, and spread thence to Italy, England, and other countries.

Madura. 1. The name of an ancient territory of South India (celebrated in Hindoo poems), of which the limits are unknown, but it was probably bounded by the sea to the S. and E., and the Western Ghats on the W.

2. A city in the Madras Presidency, containing a vast palace of the former rajahs and one of the most remarkable temples of India. In Hindoo mythology it was the capital of the territory of the same name.

Madura Foot. A peculiar disease of the foot met with in the natives of some parts of India, and believed to be caused by a parasitic fungus.

Madvig, JOHAN NIKOLAI (1804-86), a celebrated Danish scholar, for many years professor of

Latin in the university of Copenhagen; best known for his Latin grammar and edition of Livy.

Mæcenæ, CAIUS CILNIUS (d. 8 B.C.) a Roman statesman and patron of letters, contemporary of Augustus, whose friend he was before he became emperor. He it was who arranged the marriage of Octavianus, and later the peace of Brundisium, which made a partial truce between Augustus and Antony. It was in 40 B.C. that he first appears as the confidential adviser of Augustus, and in the next year he began to patronise Horace, who was perhaps introduced by Virgil and Varius, who were already well known to him. Horace repaid the attentions of Mæcenæ by extolling him in his poems, and that Mæcenæ esteemed Horace is shown by the fact that in his will he recommended the poet to the emperor's attention. In his latter days Mæcenæ seems to have fallen somewhat out of favour, and spent most of his time at his house on the Esquiline.

Mæelström, a whirlpool or, more strictly, a current, between Moskenäs and Mosken, two of the Lofoden Islands (q.v.). It was formerly an object of the greatest terror, but it is now known that the navigation presents no extraordinary difficulties, unless the wind and current are directly opposed one to another, when it becomes extremely dangerous.

Maestricht, a town of Limburg, in Holland, whose name denotes its position at the crossing of the Maas, it having been a Roman military post on the way to Cologne. It is 18 miles N.E. of Aix-la-Chapelle, and the same distance N.W. of Liège, most of the town being on the left bank, and joined to the suburb Wijk by a stone bridge. It is a garrison town, and was strongly fortified; and it is since the removal of the fortifications and the opening of railways to Aix, Liège, and Hasselt that the commerce and industries have developed. The principal trade is in earthenware, glass, arms, lead, tools, copper, zinc, tobacco, cigars, and beer. There is a 17th-century town-house of some note, the church of St. Servatius has a *Descent from the Cross* by Vandyk, while the church of Our Lady has two old crypts and a fine 16th-century choir. At Pietersberg, in the neighbourhood, are some sandstone quarries which are renowned for their wonderful galleries, many thousands in number and extending for miles, in which have been found some remarkable fossils. The district retains its own dialect.

Mafeking, a town in Cape Colony, from which Dr. Jameson (q.v.) started on his famous raid (1896). In the Boer War (1899-1902) it was besieged for seven months, but was gallantly defended by Baden-Powell, who was finally relieved in May, 1900.

Mafia, a secret society in Sicily, analogous to the Camorra (q.v.) of Naples.

Magar, a people of the southern slopes of the Himalayas, whose territory lies between the Marmi and Thaksya, Nepal; three main branches: Rana, Thapa, and Alaya, with 19, 20, and 29 tribes respectively; practise Hindu rites and speak both

Khas and a Tibetan dialect. From the resemblance of the name, attempts have been made to affiliate the *Magars* to the *Magyars* of Hungary, with whom they have no connection, being of nearly pure Tibetan stock.

Magdalene, ST. MARY, a saint of the Christian Church as to whose identity there is some doubt, some considering her to have been born at Magdala, near Tiberias, and to be she out of whom Christ cast seven devils, others taking her to be the woman that was a sinner and anointed Christ's feet. This is the view of St. Gregory and the Church generally.

Magdeburg, the capital of the Prussian province of Saxony, and one of the strongest fortresses of Germany, is on the left bank of the Elbe, consisting of the town proper and the four suburbs Friedrichsstadt, Neustadt, Sudenburg, and Buckau. Between the old and new Elbe, and separating the main town from Friedrichsstadt, is the island of Werder, which contains the citadel, and is connected with each bank by a bridge. There is one good street, and a fine promenade along the Elbe. A park occupies the site of a convent suppressed in 1810. The 13th- and 14th-century cathedral is the burial-place of Otho the Great, and contains a fine monument to Archbishop Ernest (1497), and there is a church of the 12th and 13th centuries. Among the chief buildings are the town-hall, with a statue of Otho in front, the theatre, governor's house, railway station, and exchange, and there are some fine houses in the old market. There is much trade in agricultural produce, manufactured goods and wines; and among the chief industries are iron-works, distilleries, cotton-mills, and the manufacture of woollens, sugar, silk, spirits, tobacco, chocolate, chicory, organs, and pianos. It is the headquarters of an army corps, the seat of the provincial court of appeal, and has many good educational establishments. In 1631 the town was sacked and almost entirely burnt, with the exception of the churches, and was finally restored to Prussia in 1814.

Magdeburg Hemispheres are two hollow hemispheres made of some strong material, such as brass or gun-metal, which can be accurately fitted on each other. Before putting them together it is usual to smear the edges with grease. The hollow sphere then formed is exhausted of air through a stopcock with which one of the hemispheres is provided. After the exhaustion is complete it is found that an immense force is needed to pull the two parts asunder, the force increasing with the diameter of the hemispheres. The two hemispheres are pushed together by the pressure of the atmosphere; so, if a complete vacuum were obtained the force required to separate the parts would be 15 lbs. multiplied by the number of square inches in the base of either hemisphere.

Magellan (properly MAGELHAENS), FERNANDO DE, Portuguese voyager, born about the year 1470, entered the service of Spain, and undertook to discover a new route by the westward to the Moluccas. In October, 1520, in this endeavour, he traversed the strait which now bears his name. In the following

month he discovered the Pacific, and on March 6th, 1521, sighted the Mariannes. In an unprovoked action with the natives of Matan Magellan was killed in 1521. The expedition, or so much as remained of it, returned under Sebastian del Cano.

Magellan, STRAITS OF, between Patagonia and Tierra del Fuego, are 375 miles long with a breadth of from 12 to 17 miles. The western part, which is the narrower, is enclosed by mountains well covered with wood, and has some good harbours, and the wider eastern part is fringed with pampas. There is a strong current, and west winds are prevalent. In the earlier part of the nineteenth century the straits were surveyed by King and Fitzroy.

Magellanic Clouds are curious cloud-like masses of a milky white colour, which are seen in the southern heavens, the greater lying between R.A. 4 h. 40 m. and 6 h., and N.P.D. 156° and 162°, and the lesser between R.A. 0 h. 28 m. and 1 h. 15 m., and N.P.D. 162° and 165°. The telescope reveals the fact that they contain not only stars—as in the Milky Way—but also nebulae, the whole appearing as a dense mass at an enormous distance.

Magenta. [FUCHSINE.]

Maggiore, LAGO, the most westerly of the Italian lakes, is 38 miles long, with a width varying from 2 to 7 miles, and is 640 feet above sea-level. The southern part is in Italy, and the northern in the Swiss canton of Ticino, the river of the same name flowing in at the north and out at the south of the lake, and in the south-west are the Borromean Islands. The depth is over 1,100 feet. To the W. and part of E. are granite mountains rising to a height of 7,000 feet, and to the S. and E. are vine-clad hills. Fish abound, and the fishing is for the most part preserved.

Magh (MOGH, MUG), a non-Aryan people of east Bengal, probably of Kolarian stock; but the name is now improperly applied in Bengal to the lowland inhabitants of Arakan generally, whose proper name is Kiungtha. The true Maghs, who give their name to the Meghna estuary of the Brahmaputra, are a vigorous, hardy people, daring boatmen, and skilled agriculturists. Those of Arakan call themselves Miam-ma, i.e. Burmese, use a slightly modified form of the Burmese alphabet, and have long been Buddhist with a moderate share of Hindu culture.

Maghrâwa, a branch of the Atlas Berbers, formerly very powerful, now reduced to a few broken tribes scattered over north Morocco, Algeria, and Tunis. They are the Makhurebi of Ptolemy, and in the national genealogies they appear as a branch of the great Zenata family. On the arrival of the Arabs (7th century) they were amongst the first Mauritanians to embrace Islam, but during the long intestine wars of later times they were nearly annihilated in the 14th century. The chief surviving group appear to be the Laghwats (already mentioned by Ibn Khaldun), who give their name to the town and oasis of Laghwat, south of the Jebel Amur, Algerian Sahara.

Magic is now a term of very wide import. At

first it chiefly consisted of astrology and the interpretation of dreams, as practised by a priestly caste, so that then the magic art was distinctly religious, and openly practised without any rebuke (cf. Dan. iv. 9; v. 11). It could not have been long before magic came to deserve the definition which Grimm gave of it—the illicit or harmful use of supernatural powers, thus marking it off from the faculty of working miracles, which is legitimately exercised. This definition was anticipated by Plato, who denounced sorcery—a particular form of magic—as an illegitimate method of forcing the gods to be helpful to man. Hence magic, at first religious, diverged more and more widely from religion as the ethical side of the latter, rather than the ceremonial, was developed. The term “magical arts” in classic times was synonymous with sorcery. People who wanted to compass unrighteous ends, or even righteous ends by unrighteous means, went to the magician, believing him to have the power to compel supernatural beings to do his will; and so magic—the illegitimate system of communication with the unseen world and influencing the powers thereof—grew up almost side by side with the legitimate system of religion. As Christianity spread and replaced heathen faiths, the gods of the latter were regarded as demons by the new teachers, and—though, of course, in a less degree—by their converts. This gave rise to a curious state of things. The old rites and beliefs lingered on, and, having ceased to be religious, became magical. They had in many cases the same end as those to which they had given place, but they stood on a lower plane, and the end was sought by what the new teachers considered illegitimate means. So even after the spread of the new faith among a people recourse was often had to the priests of the old; and Scott in his *Demonology* tells how the Scotch Presbyterians would send for a Roman priest to lay a ghost or exorcise an evil spirit that defied the efforts of their own ministers. The principle that underlies nearly all magical rites is that of association; but when the ceremonies are examined the association or connection is seen to be subjective, not objective. It exists only in the mind of the magician and of the person who seeks his aid. One of the commonest ends sought by magic was infliction of injury. To effect this, an image was made representing the person whom it was sought to injure, and the image was dried or melted before the fire, pierced with pins and thorns, shot at with a bow and arrow, or in later times with firearms, in the vain hope that the person represented would suffer thereby. The practice is still widely spread. This form of magic was also known as *black* magic to distinguish it from *white* magic, which was used to benefit, not to injure. The term magic is also applied to conjuring tricks performed by sleight of hand or with the aid of apparatus. *Natural magic* is the art of producing apparently supernatural effects by superior knowledge of the powers of nature. [DEMONOLOGY, INCANTATION, WITCHCRAFT.]

Magic Lantern is an optical instrument for throwing on to a screen magnified images of

pictures which are painted or photographed on small squares of glass and are called "slides." The date of its invention is uncertain, but an indication of it is to be found in the writings of the Jesuit Kircher, who lived in the 17th century. Until about thirty years ago it was used chiefly as a plaything for showing comic pictures, or as a means of manifesting so-called magic phenomena. Owing chiefly to the advance in photography, lantern slides are now largely used by lecturers in place of diagrams, while a slight alteration in the construction of the lantern makes it possible for scientific experiments, done on a small scale, to be rendered visible to a large audience. In its simplest form the lantern consists of a box containing a source of light with a chimney above it, a reflector behind it, while in front of it is a circular opening fitted with a brass tube. At the inner end of the tube is a lens called the "condenser," then comes a slit for the reception of the slide, and beyond that another lens called the "objective," in the focus of which, between it and the light, the object is placed. The screen is placed some distance in front of the objective. An oil-lamp was at one time the only source of light used. An improvement upon this was the argand gas-burner, but the best results are obtained with limelight or electric light. The condenser causes the light to illuminate the slide to a very high degree, while the objective forms an image of it on the screen. The slide must be put in the lantern upside down, as the image on the screen is inverted. The objective can be moved towards and away from the slide, and so enable one to focus the instrument and obtain a clear and distinct image. A lantern can only be used successfully when worked in a darkened room.

Magic Square is a square divided into a number of smaller squares or cells, all equal, and each containing one of a series of numbers. These numbers are so placed that the sum of those in each row, column, or diagonal is the same. If the numbers from 1 to 16 are arranged in the following rows, 1, 15, 14, 4; 12, 6, 7, 9; 8, 10, 11, 5; 13, 3, 2, 16; they will form a magic square, the sum of the numbers in any row, etc., being 34. From very early times mathematicians amused themselves by constructing these squares. They are supposed to have been introduced into Europe about the 15th century, but to have been known in India from the earliest times. Astrologers invested them with mystical meaning; a square containing only one cell with the number 1 represented the unity of the deity, squares containing 3, 4, 5, 6, 7, or 8 cells in a row were associated with Saturn, Jupiter, Mars, the sun, Venus and Mercury, the planets of the old astrologers. The squares, engraved on stone or metal, were used as talismans or charms to protect the wearer against evil, and are still to be found in India. The theory of the formation of such squares has been chiefly worked out by French mathematicians.

Magilp, a medium employed in oil-painting, and which consists of a mixture of mastic varnish and linseed oil.

Maginn, WILLIAM (1793-1842), was born at Cork, and educated at Trinity College, Dublin, where he showed himself an apt scholar, and took his LL.D. at 23. After teaching for some years in Cork, he came to London to try his fortune in literature, having already made his appearance in *Blackwood's Magazine* with a Latin translation of *Chevy Chase*. In 1824 he was the Paris correspondent of a short-lived newspaper, and in 1828 joined the staff of the *Standard*. In 1830 he was engaged on *Fraser's Magazine*, and in 1837 he contributed his Shakespeare papers to *Blackwood*. Besides many miscellaneous works in prose and verse, his Homeric ballads deserve mention, as well as the fact that he wrote two novels. His later life was clouded by drink and debt, and part of his last year of life was spent in the Fleet prison.

Magliabecchi, ANTONIO (1633-1714), an Italian bibliophile, who, in spite of his occupation till 1673 as a goldsmith, studied Greek, Latin, and Hebrew, and was an omnivorous devourer of books, with which his house was filled. He neglected everything for the sake of reading, and his prodigious memory for details enabled him to retain almost all he read. In 1673 he became Court Librarian to the Grand Duke of Tuscany, to whom he bequeathed his library of 30,000 volumes, which the duke afterwards presented to Florence.

Magna Charta, the charter signed by John (q.v.) at Runnymede in 1215. It provided against the abuse of the royal prerogative, and may be regarded as the basis of the English constitution.

Magna Græcia, the name given in history to the cluster of Greek colonies founded, for the most part, in the 8th century B.C., in southern Italy. The chief of these colonies, in the order of their supposed foundation, are Cumæ, Sybaris, Crotona, Rhegium, Locri, Tarentum, Siris, Metapontum, and Velia. Pythagoras visited Crotona in 530. For a long time the commerce of these colonies flourished greatly, but struggles with each other, luxury, and warfare with the neighbouring races, gradually weakened them, and they fell a prey to Rome early in the 3rd century B.C., the last to lose its independence being Tarentum. Some historians include the Greek colonies of Sicily in Magna Græcia.

Magnesia (AD MÆANDRUM), a city of Ionia (though not included in the Ionic League), in Asia Minor, near the Mæander, and ten miles N.E. of Miletus. The city was wealthy and prosperous till it fell into the hands of the Romans. Themistocles died here in 449 B.C. A temple of Artemis which existed here is said to have excelled that of Ephesus, and excavations show it to have been of great importance. Another Magnesia was a city of Lydia, on the S. bank of the Hermus. Here in 190 B.C. Antiochus the Great was defeated by Scipio Asiaticus, but the city flourished through Roman times and later. From this city we are said to get the words magnesia, magnesium, and magnet.

Magnesia, a light white powder which consists chemically of the oxide of magnesium, MgO.

It is tasteless and almost completely insoluble in water. It is formed when magnesium burns in air, but is usually prepared by strongly heating the carbonate of magnesium. Magnesia, free or combined with acids, is used considerably in medicine.

Magnesite, the mineral carbonate of magnesium (MgCO_3), usually occurs in a fibrous or reniform massive condition, but also crystalline, being isomorphous with calcite (q.v.), and dolomite (q.v.). It is generally white or yellowish, vitreous or silky, and subtranslucent or opaque. Its hardness is 3.5, and its specific gravity 2.8 to 3. It dissolves in warm hydrochloric acid with very little effervescence. It is used in the manufacture of Epsom salts, but is not an abundant mineral. It occurs, associated with serpentine, in the Tyrol, in Norway, and in various parts of the United States.

Magnesium, a metallic element which, though it is not found naturally in the free state, occurs very plentifully combined with other elements. Some of the more common compounds are *magnesite*, the carbonate MgCO_3 ; *dolomite*, a double carbonate of calcium and magnesium $(\text{MgCo})\text{CO}_3$; *kieserite* and *Epsomite*, sulphates of magnesium; *Carnallite*, a chloride of magnesium and potassium; *asbestos*, *meerschaum*, *talc*, *tourmaline*, and many other mixed silicates. The well-known Epsomite or Epsom salts (q.v.) were first found at the close of the 17th century, and were valued for their medicinal properties, while a little later other pharmaceutical preparations of magnesium compounds were in use. Black showed these were all compounds of a distinct metal, afterwards called magnesium, which was first isolated by Sir Humphry Davy. It is now prepared by heating magnesium chloride, fluorspar, and metallic sodium in closed crucibles, the crude metal being afterwards purified by distillation, then melted and cast in ingots, or drawn into wire, ribbon, etc. It is a silver white metal, which tarnishes in moist air. It is insoluble in water, but dissolves in acids. It is very light, possessing the specific gravity 1.75, is designated by the symbol *Mg*, and has the atomic weight 24. If heated in air, as by a gas or candle flame, it takes fire and burns with a bright white light, forming the monoxide MgO . This light is extremely rich in actinic or chemically active rays [ACTINISM], and hence is well adapted for the photography of dark interiors, as churches, caverns, etc. The salts of magnesium are of a white colour, and are mostly soluble in water. The oxide, carbonates, and phosphate, are insoluble, and in one of these forms, or as a double phosphate with ammonia, the element is estimated quantitatively. A hydrated carbonate formed by precipitating Epsom salts with sodium carbonate was formerly largely employed medicinally under the name of *magnesia alba*, while many other compounds of the metal, e.g. oxide, carbonate, sulphate, citrate, are still employed in medicine as antacids, mild purgatives, and aperients.

Magnetic Pyrites is a naturally occurring sulphide of iron with composition somewhat variable

but corresponding approximately with the formula Fe_7S_8 . It occurs as a bright brassy mineral (specific gravity 4.5), which occurs massive or crystallised in rhombohedra, and possesses magnetic properties which are, however, not as marked as those of the magnetic oxide. It frequently contains nickel, and is occasionally used as a source of this metal.

Magnetism (*magnes*, "the lodestone"), is a special condition of a body, readily recognised by well-known properties. Those bodies that exhibit such properties are termed magnetic, and are best exemplified in iron and steel. The earliest observations were made on natural magnets of lodestone, and from remote periods. One practically important property of a magnet was known, that if suspended horizontally by a fibre or on a float it would turn into a definite direction and point approximately to the geographical north and south. Magnetism may be induced in a magnetic substance by simply placing it in the neighbourhood of a magnet, the surrounding medium evidently being in a condition different from that which obtains when no magnet is near. Moreover, the presence of a highly magnetic substance in a medium in such a condition, renders it more difficult to magnetise a less magnetic substance by simply placing it in the same neighbourhood. In fact, magnetism may be treated quantitatively, and any increase in the intensity of a portion of the magnetic field as the magnetised medium is called, due simply to the introduction of magnetic matter, is accompanied by a decrease in another portion. The magnetised state is dual; there are two different conditions in the one magnet. If the substance is in the form of a bar, and the whole length of this has been treated as uniformly as possible in the production of the magnet, the two ends will exhibit opposite effects, the end that points towards the geographical north being called the north pole, and the other end the south pole. It will be found experimentally that the north pole will attract the south pole of any other magnet, but will repel its north pole. The south pole, on the other hand, will attract north and repel south. Like poles thus repel each other, and unlike poles attract each other. If a north pole of a magnet be remote from its south pole, its north will be found, when placed in the neighbourhood of another magnet, to travel away from the north or towards the south of the second. Also it is found that the attraction in the one case and repulsion in the other is proportional to the inverse square of the distance between the two poles. The strength of a magnetic pole is usually measured by determining its force of attraction or repulsion on a known pole at a known distance, the force at a definite distance being proportional to the product of the strengths of the two poles. A bar of steel may be magnetised by rubbing one pole of a magnet along its whole length several times, providing that the bar is only rubbed in one direction. Any reversal of the direction of rubbing neutralises part of the magnetisation. A more effective method is to start at the middle with two unlike poles of two magnets

and rub the bar in opposite directions. Steel possesses the property of retaining the magnetic condition after the magnetising force is withdrawn. Careless handling may partially destroy the magnetisation; violent heating will do so entirely. The theory that magnetisation involves a rearrangement of the particles of the substance is supported by the facts that magnetisation of a bar is accompanied by change of volume, that rapid alternations of its magnetism cause a distinct humming sound, and that the *retentivity* of a substance for magnetism or its reluctance to part with it varies with its composition. Wrought-iron is much more easily magnetised when placed in a magnetic field, but much more easily demagnetised when removed from it. The power of a substance for concentrating magnetism within itself is termed its *permeability*, and wrought-iron is by far the most powerful substance in this respect. Most substances—bismuth, for example—are less capable of retaining magnetism than the surrounding air medium. The bismuth will appear to be repelled by a magnet, and will assume a position at right angles to the direction assumed by a magnetic needle. Such substances are termed *diamagnetic*.

The most powerful means of inducing magnetism in a substance is by means of an electric current flowing round a coil of wire. This is due to the fact that such an electric current affects the medium in exactly the same way as a magnet, and any bar with great permeability, placed in the neighbourhood of an electric circuit, is magnetised immediately. The most effective arrangement is to have a bar of very soft and pure iron acting as a core to the bobbin round which the wire is wrapped that conveys the current. The effect is *nil* if the current is alternating. With the usual convention concerning the direction of flow of the current, which assumes its passage to be along the wire from the copper (or corresponding portion of the battery) to the zinc, it is found that if the bar is viewed end-on, so that the current appears to be going in a clockwise direction, the near end of the bar is made a south pole, and the more remote end a north pole. If the bar is absent the electric circuit still behaves as a magnet, but not so powerfully, and any two such circuits will attract or repel each other according to the same rules as apply with ordinary magnets.

The behaviour of the magnetic needle in pointing towards the north and south is explained by the theory that the earth itself is a magnet, somewhat irregularly magnetised, with its poles near the geographical poles. If a needle is balanced horizontally before being magnetised, it will, when rendered magnetic, tend to point in the direction of the resultant magnetic force. Thus in English latitudes it points downwards, the angle of inclination being called the *dip*. At the magnetic poles the dip is 90°. Isoclinic lines (q.v.) on charts of the surface of the earth mark those places where the dip has the same value. The vertical plane in which the needle tends to place itself is not usually a geographical meridian. In England, for example, the needle points about 20° west of north. Isogonic lines (q.v.) show those places where the declination

from the geographical meridian has the same value. The facts mentioned above concerning the mutual actions of magnets on electric circuits or of circuits on circuits form the experimental basis of electromagnetism, by which may be explained the nature and action of dynamo-electric machinery. Modern electromagnetic theory deals particularly with the medium surrounding a magnet or an electric circuit, and suggests that not only are the stresses alike that are produced in the medium by either cause, but that they are identical in character with those that accompany the transmission of light through the medium. Electromagnetic disturbances, produced, for example, by an alternating current of high frequency in a neighbouring conductor, are transmitted through the medium at the same speed as light. This idea resulted initially from theoretical considerations of Clerk-Maxwell, but it has more recently received much support from experimental research of Hertz, who has made observations on the reflection and refraction of electromagnetic waves, which show that they are precisely similar in this respect to light-waves.

Magnetism, ANIMAL. [ANIMAL MAGNETISM.]

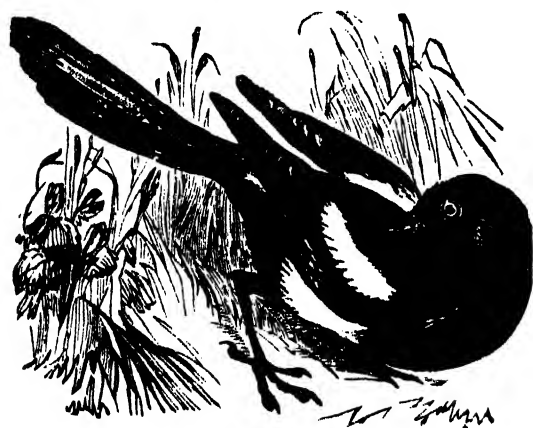
Magnetite, or LODESTONE (q.v.) (Fe_3O_4), a black oxide of iron strongly attractable by a magnet.

Magnetometer is an instrument for measuring magnetic forces. It is used to record the changes in the intensity of the earth's magnetism. One form consists of a bar magnet suspended by two equal threads which would naturally hang in a vertical plane. The magnet, however, causes them to twist out of that plane, and as the intensity of the earth's magnetic force alters from time to time the magnet takes up a new position. This instrument is known as the bifilar magnetometer. It is usually provided with a small mirror, which reflects a beam of light, and is thus enabled to photograph its own movements.

Magnolia, a genus comprising some twenty trees or shrubs, named after Pierre Magnol, professor at Montpellier in the 17th and 18th centuries, and giving its name to the thalamifloral order Magnoliaceæ. They have scattered, entire, leathery leaves, generally large, with large deciduous stipules, and themselves either evergreen or deciduous. The large, terminal flowers are white, pink, or purple, and often fragrant. They have three sepals, six, nine, or twelve petals in whorls of three, indefinite stamens and carpels, arranged spirally, the latter forming follicles from which, when split, the ripe seeds hang by remarkably long funicles. They are natives of North America, Mexico, Japan, China, and the Himalayas. *M. acuminata*, the cucumber-tree; *M. tripetala*, the umbrella-tree; *M. glauca*, the swamp sassafras or beaver-tree, and the favourite *M. grandiflora*, were introduced from North America, mostly in the last century. *M. conspicua*, from Japan and China, flowers before producing its leaves, as also does the most magnificent *M. campbelli* of Sikkim and Darjiling, which reaches 80 feet in height and 12 feet in girth, with white or pink flowers 10 inches across.

Magomi, one of the chief nations of Bornu, Central Sudan, who arrived in the 13th and 14th centuries from the north (probably the Tibesti highlands, Central Sahara), gradually reduced a great part of the country, and gave many kings to Bornu. They are scattered in small groups over most of this region, though their chief seat is the city of Magommeri in the heart of the country. The Magomi are a Negroid people of somewhat coarse type, closely related to the Kanuri, the present ruling race, speak the same language, and, like them, have long been Mohammedans.

Magpie, any bird of the Corvine genus *Pica*, with nine species, from the Palæarctic region, Arctic America, and California. The bill is entire, with cutting edges, and has at its base bristles directed forward; the tail is very long and graduated. *P. rustica*, the Common Magpie, with nearly the range of the genus, is a common, but very beautiful, British bird about 16 inches long, with black



MAGPIE (*Pica rustica*).

plumage, glossed with brilliant metallic reflections; the scapulars and under surface are white, as are the primaries, except for their black tips. These birds are mischievous and predatory, doing great damage to the poultry yard, and to the eggs and young of feathered game, so that farmers and keepers unite to thin their numbers. They feed also on mice, frogs, molluscs, and worms. The large dome-shaped nest is lined with soft grass, and surrounded with stout thorns to keep away intruders. The eggs are pale bluish-white, with brown spots, and the number varies from six to eight. The magpie readily adapts itself to life in a cage, and soon learns to articulate words; but, whether tame or wild, it is a terrible thief, and will carry off and hide any bright glittering object that falls in its way. Magpies are generally considered birds of ill omen, and figure largely in European folk-lore.

Magpie Moth (*Urapteryx sambucaria*, Linn.) is the largest of the British Geometers (q.v.), of which group of moths it is a very convenient type, as it is so very abundant in gardens. The larvæ feed on fruit trees. The colour of the moth is white, and it has a variable series of yellow bands and black blotches.

Magwamba (MAKWAPA, BA-TONGA), a Bantu people of south-east Africa, on the coastlands

between Delagoa Bay and Sofala, and stretching along both banks of the Limpopo inland to North Transvaal; they have branches even as far north as Nyassaland, where the Ba-Tonga of the Bandawé district speak a Si-Gwamba dialect, which has been reduced to writing by the missionaries. But most of the nation are still ancestry-worshippers, degraded by contact with the whites, addicted to hemp-smoking and drink, and in the Transvaal practically serfs of the Boers. (Berthoud, *The Gwamba Language*, in the *Journal of the Royal Asiatic Society*, xvi., Part I.).

Magyars, a historical people either of Finno-Ugrian or (more probably) of Finno-Turki stock, who, after a long sojourn on the South Russian steppes, were driven west by the Khazars, crossed the Carpathians, and entered Pannonia (Hungary) in the 9th century, where they have since been the dominant race. For three hundred years they were the terror of all the surrounding nations, extending their predatory excursions over Central Europe as far west as France, and south-west to the Adriatic, where they secured a permanent footing in north Dalmatia. But in the 13th century they embraced Christianity under King Stephen, and later became an eastern bulwark of Christendom against the invasions of the Osmanli Turks. The Magyars hold a peculiar position in ethnology, their primitive Finno-Tatar physical type having been for the most part assimilated by continuous crossings to the normal European (Caucasic), while they have preserved intact their national speech, which appears on the whole to be more nearly allied to the Turki than to the Finnic branch of the Finno-Tatar linguistic family. They have also in all essentials mainly conformed to the general standard of European culture, although still betraying their original nomad instincts in their great love of horsemanship, their preference for the Danubian plains over the surrounding mountains, and for pastoral over strictly agricultural pursuits. Although a large proportion are Roman Catholics, it is noteworthy that they have always shown a singular regard for the English, who are welcomed in their homes more as brothers than strangers. This is, perhaps, in some measure due to the unpopularity of Russia, which is regarded as England's rival in the East. Calculated on the basis of language, the Magyar nation numbered at the last census (1900) 9,516,000 persons; but many of Magyar speech are certainly not originally of Magyar stock, for the language, owing to political influences, has spread (and continues to spread) amongst the surrounding Slavonic and Germanic populations, the increase in about twenty years being estimated at over 1,500,000. The Magyars form the great bulk of the population on all the lowlands of Hungary proper, and are also numerous in Transylvania, where they are known as *Szekely* ("Borderers"), in reference to their advanced position towards the former frontiers of Turkey. As a race, the present Magyars may be called handsome in the European sense, with regular features, shapely pliant figure, of medium height, graceful carriage, and fair muscular development, though this picture applies rather to

the nobles and upper classes than to the peasantry, whose features are often extremely coarse and even of pronounced Mongolic type. The Magyars are a brave and chivalrous people, frank and generous, fond of display and extravagant, which often makes them a prey to the Jewish money-lenders, into whose hands many of their ancestral lands have already passed, or to whom they are heavily mortgaged.

Mahābhārata ("THE GREAT HISTORY OF THE DESCENDANTS OF BHARATA"), one of the two great Sanskrit epics, containing over 100,000 couplets. The story of the struggle between the Kauravas and the Pāndavas, which forms the main theme, probably rests on a basis of historical fact. These two families were the sons of two brothers, Dhritarāshtra and Pāndu, descendants of Bharata. The Pāndavas, supposed to be incarnations of certain deities, were ultimately victorious. In consequence of the numerous episodes dealing with mythology, cosmogony, religion, law, and philosophy, the book came to be regarded as a cyclopædia of ancient Hindu learning. According to tradition, it was written by Vyāsa; but, as this name means "arranger," the work is evidently a compilation.

Mahanadi, a river of the Central Provinces of India, rising in the wild region, 20 miles S. of Raipur, and having an easterly course of 520 miles to Cuttack, passing through the Eastern Ghāts by a gorge 40 miles long. At Cuttack, which is the head of the delta of Orissa, the river divides and flows E. and S.E. A great quantity of flood water is brought down by the river, and this water is much utilised by means of canals for irrigation purposes.

Mahdi (Arabic "directed one," hence "director," "guide"), a divinely-inspired teacher or ruler to whose appearance Moslems look forward as the Jews do to that of the Messiah. His advent on earth is said to have been foretold by the prophet himself. The Shiah sect of Mohammedans, who recognise only the kalifs that were lineally descended from the prophet, maintain that the Mahdi has appeared already in the person of Mohammed Abu 'l Qāsim (868-79), the twelfth Imām (a term corresponding to the Sunnite kalif), and that he is now concealed but will return before the end of the world. Their opponents, the Sunnis, believe that no Mahdi has as yet appeared. Numerous pretenders have claimed to be the Mahdi, among them Mohammed Ahmed (1843-85), a native of Dongola, who established himself at El-Obeyd, in Kordofan, and excited the Soudanese insurrection, which was quelled after severe fighting.

Mahogany (*Swietenia Mahagoni*), a large tree belonging to the order Meliaceæ, native to Mexico, Central America, and the West Indies, and yielding one of the most generally used of cabinet woods. The leaves resemble those of the ash: the flowers are clustered and small, with their parts in whorls of five, and ten united stamens; and the fruit is a pear-shaped woody capsule with winged seeds. The bark has febrifuge properties and the wood is a rich reddish-brown, often richly mottled, uniform in grain, susceptible of the highest polish, and very

durable if not exposed to marine boring molluscs. In Mexico the timber is sometimes in 30 feet lengths and 48 inches square. Mahogany is commonly divided into *Spanish*, the darker, heavier and more figured, from San Domingo and Cuba, and *Honduras*, lighter, softer, and plainer, from the mainland. Though noticed during Raleigh's expedition in 1595, it was only introduced in the 18th century. It is employed in carving, turning, veneering, and cabinet-making, and for solid furniture, and is classed as second-class in Lloyd's ship-building list. We import about 40,000 tons annually, about half from Mexico and the rest from Honduras, Jamaica, and the other islands.

Mahomet. [MOHAMMED.]

Mahony, FRANCIS (FATHER PROUT) (1804-1866), priest, scholar, journalist, and poet, was born in Cork, educated at Amiens and Paris. Having been ordained, he served in Switzerland and Ireland, and then was appointed to duty in London. In 1834 he became connected with *Fraser's Magazine*. He was noted for his elegant translations from English into Latin, French, Greek and Italian verse, and also from French, Latin and Italian into English. In 1846 he became *Daily News* correspondent at Rome, and for the last few years of his life wrote letters from Paris for the *Globe*. His *Bells of Shandon*, *Mistletoe*, *Lady of Lee*, *Legend of Arethusa*, are much admired, and he possessed a deep though quiet fund of humour. His *Reliques* were published in 1836 and 1860, and his *Final Reliques* in 1876.

Mahratas (MAHARATAS), a historic people of west Central India who, because of their Aryan (Neo-Sanskritic) language, are usually regarded as Aryans, but who are rather originally of Dravidian stock, modified by Kolarian and Aryan elements, and Aryanised in speech, religion, and general culture. From remote time the term *Maharata* was applied to all the Hindu castes of the region, which was the *Maha-Rashtra* ("Great Kingdom") of the early writers, and which extended from the river Tapti southwards to the upper course of the Kistna and eastwards to the frontiers of the present territory of the Nizam. Now, however, the term is limited to the *Kumbi*, that is, the agricultural Sudras who in the 18th century rose under Sivaji against the Mussulman rule of the Great Moghul, and overran India with their military and plundering expeditions. The Mahratas still belong essentially to the Sudra caste, showing that they were not originally Aryans, as is also evident from their almost Mongoloid type—rather low stature, somewhat flat features, small nose, wide nostrils, small black eyes, long jet black hair, dark yellow or bronze complexion, but much lighter in the women. The language, which seems more akin to the Sauraseni and Magadhi than to the Maharashtra Prakit, is highly cultivated, and spoken in about eight dialects by over 12,000,000, mainly Hindus by religion.

Māi, ANGELO, CARDINAL (1782-1854), an Italian scholar, was born in Lombardy and educated at a Jesuit college. Having been appointed to a cure

at Milan, he became librarian there, and made valuable discoveries among the MSS. of the library, among other things, palimpsests of Cicero and Plautus, and publishing in 1822 a valuable edition of the *De Republica*. Invited to the Vatican, he took charge of the library, and in spite of the calls made upon him by his ecclesiastical rank and dignities, he worked hard among the unedited MSS. there, and did much to advance the cause of learning.

Maiden-hair, the popular name of the species of *Adiantum* (q.v.) and some other ferns having slender black leaf-stalks. The rare British species *Adiantum Capillus-Veneris*, *A. cuneatum*, the large-leaved *A. farleyense*, and the tiny-leaved *A. gracilimum* are commonly cultivated in greenhouses and largely used in bouquets. *Asplenium Adiantum-nigrum*, the black maiden-hair spleenwort, and *A. Trichomanes*, the English maiden-hair, are common British ferns.

Maidstone, municipal and parliamentary borough (1 member), county and assize town of Kent, 41 miles from London, and half-way between London and Dover, is situated in a valley, chiefly on the E. bank of the navigable Medway, which is crossed near the railway station by a stone bridge, rebuilt in 1879. The Flemish introduced here the broadcloth trade and the manufacture of linen thread, but these have passed away, and the chief industries are now brewing and paper-making. The town is the centre of a rich hop district. The grammar school was founded in 1549, and there are charities to the amount of £3,000. The church of All Saints—one of the largest parish churches in England—was built in place of St. Mary's, demolished by Archbishop Courtenay in 1395, and contains sedilia, and the carved oak seats of the collegiate priests, the interesting ruins of whose college, founded by Archbishop Courtenay, are near by. The Archbishops lived here, but the present palace is Elizabethan. Among places of interest are the museum and library—established (1859) in the ancient Chillington House, itself an interesting relic—the town hall, the county gaol (built of ragstone from the neighbouring quarries, renowned for the valuable fossils found there), and the barracks. Pop. (1901), 33,516.

Maigre (*Sciæna aquila*), a food-fish of the type-genus (with about 50 species, some from freshwater) of the acanthopterygian family Sciænidæ. It is common in the Mediterranean, and sometimes strays to Britain. Specimens six feet in length are recorded, but the general size is much less.

Maidun, an ancient Irish hero, whose exploits are dealt with by Dr. Joyce in his *Ancient Celtic Romances* (1879). He was born in County Clare, and, his father having been killed by pirates, he set out on a three years' voyage in search of the slayers of his father. After a set of most marvellous adventures, he found and forgave the murderers.

Maimon, SOLOMON (1754-1800), a philosopher, was born in Russia. He studied the Talmud, and was trained for a rabbi. Having made the acquaintance of the system of Maimonides, he went

to Berlin, where he studied philosophy, science, and languages. His life was aimless and poverty-stricken, and he wrote little, his chief works being *Versuch einer Transcendentalen Philosophie* (1790), and an *Autobiography* (1792).

Maimonides (1135-1204), a Jewish philosopher, born at Cordova. He became a rabbi, and practised medicine, becoming the author of several medical works, and being appointed court physician to Saladin of Egypt. He studied deeply Greek and Arabian philosophy, and wrote upon logic. Astronomy also and mathematics occupied his attention; but his great claim to fame is that he was one of the greatest of Jewish Talmudists and theologians. His codification of Jewish law (composed in Hebrew), called the *Mishneh Torah*, is still highly thought of and much used, and his *Guide of the Perplexed* (composed in Arabic) has a great reputation.

Main, river in Germany, is formed by the White Main, rising in the Fichtelgebirge at a height of 2,900 feet, and the Red Main, rising a few miles from Bayreuth; these two uniting 4 miles below Kulmbach in Bavaria, and flowing with an irregular westerly course of 300 miles, for 200 of which it is navigable, passing many important towns—Frankfort among them—and joining the Rhine opposite Mainz. It flows through a fertile country abounding in vineyards, and receives the waters of the Saale and Regnitz. By means of the Altmühl and Ludwig's Canal it is connected with the Danube.

Maine, the most north-easterly of the United States, situated between lat. 43° and 47° N., and between long. 67° and 71° W., having New Brunswick to the E. and N., and New Hampshire S.W. and the Atlantic S.E. It is 302 miles long by 285 miles broad, and its 225 miles of direct coast-line are increased to 2,500 miles by deep indentations, whence its designation as "hundred-haroured Maine," while the coast is fringed with islands. The watershed crosses from E. to W. at about 140 miles from the coast, and the rivers have generally a N.N.E. or S.S.E. direction. These rise at a considerable height—e.g. the Kennebec (2,000 feet), Androscoggin (3,000 feet), Penobscot (2,500 feet), St. John (1,980), and Saco (1,890), and the great falls, with the storage of water provided by a system of lakes which form a characteristic feature of the state, give an immense power not yet greatly utilised; and the principal falls, being in the lower courses, are no impediment to navigation. These lakes number 1,570, and occupy one-fifteenth of the state, the largest being Moosehead, on the Kennebec river (35 × 10 miles), and many of the most picturesque are in unsettled districts. The Appalachians stop short of the state, and the undulating surface is dotted with conical well-wooded peaks. The rocks are metamorphic, and there is plenty of granite, felspar, quartz, and the like. A very pure surface iron is found, and is worked at the Katahdin iron-works, and slate, marble, limestone, silver, and copper are other productions. The soil is glacial, and the fossils are of an Arctic nature, while the animal

world partakes of N. and S., and fish are abundant. The picturesque lake scenery and the climate, which has a summer average of 62·5°, attract multitudes of tourists. Many of the pines which gave it the name of "Pine-tree State" have been cleared off. Augusta is the state capital, while Portland is the largest town and principal sea-port. The chief industries are cotton and woollen manufacture, tanning, boot- and shoe-making, iron-working, lumbering, and fish-canning, and some wooden ship-building. Ice is largely exported. The remnants of two Indian tribes still linger in the state. The law prohibiting the sale of liquor is in force in this state.

Maine, HENRY JAMES SUMNER, SIR (1822–88), was educated at Christ's Hospital and Pembroke College, Cambridge, gaining the Craven Scholarship and the Chancellor's Medal, and being Senior Classic and a Senior Optime. After being elected fellow and tutor of Trinity Hall, he was appointed (1847) Regius Professor of Civil Law. In 1850 he was called to the bar, and in 1854 became reader in jurisprudence at the Middle Temple. In 1862 he went to India as member of the Law Council, and 1870 became professor of Comparative Jurisprudence at Oxford. In 1871 he was on the Council of the Secretary for India, and was made K.C.S.I., in 1877 he became Master of Trinity Hall, and in 1887 Whewell Professor of International Law. He is best known generally for his valuable contributions to the knowledge of early societies, his most noted works being *Ancient Law* (1861), *Village Communities* (1871), and *Early Law and Custom* (1883).

Maintenance, IN LAW, interference in a suit by an uninterested party, with a view to maintaining the litigation. It is a punishable offence. [CHAMPARTY.]

Maintenance, CAP OF, in heraldry, a cap of dignity, originally borne before English sovereigns at their coronation, used in blazonry as the supporter of the crest (at first of noble personages only) in place of a crown, coronet, or wreath. The name is also given to a cap borne on state occasions before the mayors of certain cities.

Maintenon, FRANÇOISE D'AUBIGNÉ, MARQUISE DE (1635–1719), mistress and second wife of Louis XIV., was the daughter of a persecuted Huguenot. After a time in Martinique, Françoise returned to her country, and was converted to Protestantism, being re-converted at the instigation of the king. Falling again into neglect, she married Scarron in 1651, and was thus introduced into the most brilliant society of the time. Scarron died, and after Anne of Austria's death the king would not continue the pension allowed to Scarron's widow. However, Madame de Montespan interested herself on Madame Scarron's behalf, and committed to her the care of the king's children. She came to court, took the king's fancy, and finally took Madame de Montespan's place, finding favour generally, even with the queen, and eventually marrying the king. Her political influence was great, and her *Letters* show talent, and throw light upon the Court intrigues of the time.

Mainz, or MAYENCE (Moguntia), a strong fortress, formerly a free city, now the largest town of the Grand Duchy of Hesse-Darmstadt, is on the left bank of the Rhine, nearly opposite the entrance of the Main. A stone bridge in place of the former bridge of boats and a railway-bridge connect it with Kastel on the opposite bank. Some of the streets are narrow and irregular, but much of the old town was destroyed by an explosion in 1857, and was rebuilt in a better style. There is a good street near the river, and a fine embankment 4 miles long, and 300 feet wide, and to the S. is a park. The commerce, which had decayed, has now revived. New harbour works have been executed, and Mainz is now, besides being a great railway centre, one of the chief seats of the Rhine trade. The chief articles of trade are wine, grain, timber, flour, and oil, and among the industries are the manufacture of leather, furniture, carriages, chemicals, and carpets. The old cathedral of the 12th, 13th, and 14th centuries, restored by Napoleon in 1814, and further restored 1870, has six towers, one of which is nearly 300 feet high. It contains the tomb of Archbishop Boniface. There are other churches of note, a palace of the Grand Dukes, the old Electoral Palace (now a museum, etc.), a theatre, the arsenal, statues of Gutenberg (who here invented printing) and Schiller, and two fountains. Among the Roman remains is the Igelstein, supposed to have been erected to the son-in-law of Augustus (Drusus), who had here a *castrum*, and a *castellum* (Kastel). In the 3rd century the Bishop of Mainz became Archbishop and Primate of Germany. In later times he was head of the electors who appointed the emperors. It became a German fortress in 1871.

Maistre, (1) JOSEPH DE (1754–1821), diplomatist and polemical writer, was born at Chambéry, and studied at Turin. He entered the Civil Service under the House of Savoy, and became a member of the Senate. The Revolution drove him to Lausanne, and there in 1796 he wrote *Considérations sur la France*. He was afterwards summoned to Turin, and later to Sardinia, and was in 1802 sent as envoy to St. Petersburg. In 1815 he returned to Savoy and to high office. His polemical works, *Du Pape*, and *Letters on the Inquisition*, were of an Ultramontane character. He also wrote *Soirées de St. Petersbourg*, and an examination of Bacon's philosophy. (2) XAVIER DE, brother of the above, was born at Chambéry, and for a time served in the Piedmontese army. During this time he wrote *Autour de ma Chambre*. Afterwards he went to St. Petersburg, and became to all intents and purposes a Russian. Other well-known works of his are *Le Lépreux de la Cité d'Aoste* and *La jeune Sibérienne*.

Maithili, a Neo-Sanskritic language intermediate between Hindi and Bengali, spoken in North Berar and the Terai district, South Nepal, by about 10,000,000; written in the Devanagari, Bengali, and Kayathi characters indifferently; chief varieties: Chapra, Bhagalpuri, Madhubani; grammar by G. G. Grierson (Calcutta, 1881).

Maitland, JOHN. [LAUDERDALE.]

Maitland, SIR RICHARD (1496-1586), lawyer and poet, was the son of a Maitland who fell at Flodden. Educated at St. Andrews and in France he became in 1552 a border-commissioner, and soon after a Lord of the Session, and from 1562 to 1567 he was Lord Privy Seal. He remained on the bench till the age of 88. Besides poems, chiefly satirical, he wrote a *History of the House of Seyton*.

Maitland, WILLIAM (1525-73), son of Sir Richard, and better known as LETHINGTON from the name of his estate. He was made Secretary of State by Mary of Guise, but his views were too much in favour of the reformers to enable him to retain the office. He entered into controversy with John Knox, and was sent to announce to Queen Elizabeth the marriage of the Queen of Scotland with Darnley. He was concerned in the murder of Rizzio and in that of Darnley, but was one of those who accused the queen of being privy to the latter. He fought against the queen at Langside, but afterwards espoused her cause, and, after being arrested by Murray for compassing the king's death, he helped to hold Edinburgh for her, together with Kirkcaldy of Grange. Upon the surrender the latter was executed, and Lethington died (it is thought by his own hand) in prison.

Maize, or INDIAN CORN (*Zea Mays*), a cereal grass, unknown in a wild state, but probably indigenous to tropical America. It is found in ancient Peruvian tombs; but seems to have been cultivated in Java and other equatorial Pacific islands from ancient times, and introduced thence into China, India, and Turkey, so that Gerard, in 1597, describes it as "Turkey corn," and in Germany it is to this day called "Türken." At the discovery of America it was found in cultivation throughout the two continents, and there are now more than 300 varieties known. It prefers a deep, rich, warm soil, such as that of the Mississippi basin; but on comparatively poor sandy soil will yield a crop where clover and lucerne will not. Intolerant of frost, or even of cold nights, it is in England almost exclusively useful as green fodder, of which it will yield from 50,000 to 80,000 lbs. per acre. Being very sweet, the stems are much relished by sheep and cattle. In the western prairies it is even grown for fuel. The plant is monoecious, producing its staminate or male flowers in a large feather-like cluster at its summit, and the cobs or dense spikes of female flowers ending in pendulous, pink, silk-like tassels of long stigmas in the axils of lower leaves. The sheaths of the leaves are used in packing oranges and cigarettes. The grains may be white, yellow, purple, red, or striped, and differ considerably in composition. The hard *flint* varieties are known as *pop-corn*, because when roasted the skin bursts and the meal swells. The *sweet* varieties are largely eaten unripe as *green corn* in America. Maize is very nutritious, being richer in albuminoid matter than any other cereal, and, being also richer in oil, it has great fattening value; but it does not by itself make good bread. In Spain and Portugal it is mixed

with rye meal for this purpose. When deprived of its gluten it constitutes *corn-flour*, *corn-starch*, *oswego*, or *maizena*. Besides its use on an enormous scale for food, maize is being more and more employed in distillation and in the manufacture of starch and glucose. Besides its extensive cultivation in southern Europe, in India, and, under the name *mealies*, in South Africa, there are 70,000,000 acres under maize in North America, the annual produce of the United States amounting to 2,000 million bushels. Our import of maize is now about 2,250,000 tons annually.

Majolica (MAJORCA-WARE), so-called by Italians because the earliest specimens came from the island of Majorca. The term is applied to decorative pottery with a lustrous, enamelled surface, produced from the 15th to the 17th century, especially to the more highly-ornamented and vividly-coloured specimens made in Italy, Spain, and Majorca. Modern majolica, generally made in large pieces, offers a rough imitation as to colour and lustre of the pottery properly entitled to the name.

Major (military), the title of the lowest field-officer, next in rank above a captain and below a lieutenant-colonel. A major is often in command of a battalion, and, as the representative of his superior officer, of a regiment.

Major, JOHN (1470-1550), a theological writer, born near North Berwick. He was educated at Cambridge, and at Paris, where he graduated M.A. in 1496, and Doctor 1505, and where he lectured for some time. From 1518 to 1522 he was principal of Glasgow University, where John Knox attended his lectures, and then became principal of St. Andrews, where George Buchanan was his pupil. At his death he was head of St. Salvator's.

Majorca, the largest of the Balearic Isles, is 100 miles from the Spanish coast, and 150 from Algiers. It is 60 miles long by 40 wide, and contains 1,310 square miles. The climate is salubrious by reason of the sea-breeze. The island is very productive of olive, almond, fig, and other fruits, and makes good wine. The chief industries are the manufacture of cotton, cloth, silk, shoes, and rope, and there is a large trade with Spain. A railway leads from the capital, Palma, to Manacor and La Puebla. Near Manacor are some noted caves, and near Alcudia, which is the port for Spain, were marshes which have been drained and cultivated.

Majority, the period of anyone's full age (which is 21 years). A minor comes of age in the eye of the law on the day preceding the anniversary of his birth.

Makalaka, a Bantu people of Bechuana stock, chiefly in the region north of the Limpopo, where they have long been oppressed by the Matabeles. Some have migrated northwards to the Zambesi above the Victoria Falls, and to the Bamangwato territory on the shores of Lake Ngami.

Makaraka (MAKRAKA), a large Negro nation, easternmost branch of the Niam-Niams, who migrated some sixty years ago from the Welle to their present seats in the basin of the Yei tributary

of the White Nile. They call themselves *Iddio*, the term Makaraka, i.e. "Cannibals," being applied to them by their neighbours; but although really addicted to this practice, they are in all other respects far superior to all the surrounding Nilotic peoples. They are excellent agriculturists, and before the Mahdist outbreak were largely employed as soldiers and carriers in the Egyptian service. Junker gives them the highest character for honesty, courage, patience and endurance under the greatest hardships.

Makari (KOTOKO), a Negro people of Central Sudan, where they form the bulk of the southern provinces of Kotoko and Logon, in the kingdom of Bornu; they appear to have come originally from the middle Shari basin, exterminating or absorbing the Keribina and other aborigines of their present domain. The Makari are mostly Mohammedans, and their Sultan of Logon often takes part in the slave-hunting expeditions organised by his paramount lord, the king of Bornu, against the surrounding Musgo and other more southerly pagan populations.

Makololo, a renowned people of Basuto origin, who, after their expulsion from Kuruman by the Griquas (1824), were led by their chief Sebituane across Bechuanaland northwards to the middle Zambesi, incorporating in the military caste all the young bloods of the nations conquered by them on their long wanderings of 800 or 900 miles from the south. On the Zambesi Sebituane overthrew the dominant Barotse people, and founded the so-called Makololo Empire, which after his death in 1851 passed to his young and feeble son Sekelutu. During his reign of thirteen years (1851-64) the Makololos were greatly reduced by incessant wars, so that on his demise the Barotse rose against their conquerors, exterminating them almost to a man, and restoring the Barotse state—which accepted the British protectorate in the year 1892—but a handful of Makololos had previously descended the Zambesi to the Shiré outlet of Lake Nyassa, where the terror of their name enabled them to set up a few petty states in the midst of the Manganja populations. These also, after for many years tyrannising over the natives, have been reduced to order, and are at present loyal subjects of the British authorities in Nyassaland. Of Sebituane's vast empire nothing survives except the Se-Kololo language, a corrupt form of Se-Suto, still current amongst the Zambesi tribes subject to his rule. (Livingstone, *Travels*; Holub, *Sieben Jahre in Süd-Afrika*, 1881; Serpa Pinto, *How I Crossed Africa*, 1881.)

Makua, a large Bantu nation, East Central Africa, whose domain extends from the Mozambique coast inland to the Lujende river, and from the Rovuma southwards nearly to the Zambesi delta. But although numerous and powerful, the Makuas have never developed a large state, and even within their territory several other peoples, such as the Mabilia, Medo, and Mawa, have succeeded in establishing themselves. The Makua women wear the hideous *pelele* lip "ornament," while the men, at

least on the coastland, are everywhere distinguished by a tattoo mark in form of a crescent incised on the forehead, concave side downwards. Although their territory lies within the Portuguese Mozambique possessions, the Makuas have never been subdued; but, on the contrary, have more than once driven the whites from the mainland. In 1881 their chief, Namaralo, after wasting the whole country east of Fernando Veloso Bay, raided right up to the very guns of the capital on Mozambique island. (Rev. Chauncy Maples, *Handbook of the Makua Language*; Consul O'Neill, *Proceedings of the Royal Geographical Society*, November, 1884.)

Malabar, a district of the Madras Presidency, situate upon the Arabian Sea, 145 miles long and varying in breadth from 25 miles in the N. to 70 in the S., and containing 5,760 square miles. The surface is diversified, and in the E. is traversed by the Western Ghâts, in which is an opening 25 miles across called the Palghat Gap. There are several rivers, and the country is well-wooded, and produces rice, cocoa-nuts, coffee, and pepper. Most of the population are Hindoos. The district gives its name to the neighbouring western coast of India.

Malacca. 1. A name sometimes applied to the Malay peninsula, which is attached to Further India by the isthmus of Kra. Sometimes it is taken to include the country as far as British Burma, from which it is separated by the Pakshan. Bounded on the E. by the Gulf of Siam and the China Sea, and the W. by the Bay of Bengal and the Malacca Strait, the country is well wooded, and is traversed by mountain ranges of considerable height. From the mountains the ground slopes to fertile plains, while on the coast are miles of mangrove swamps, and off the coast is a fringe of islands. The chief productions are tin, gold, silver, lead, ebony, sandalwood, and camphor; and coal and iron are found, but not worked. Rice, sugar, cotton, tobacco, cocoa-nuts, and areca-nuts are the chief objects of cultivation. The climate is not good for Europeans. The various divisions, Malacca, Singapore, etc., are separately treated.

2. A British settlement and town on the S.W. coast of the Malay peninsula, 100 miles from Singapore, having a length of 42 miles and a breadth varying from 8 to 25 miles, and an area of 659 square miles. Inland are low hills, but the coast districts are swampy, owing to their low level and the great rainfall. The chief products are tin, tapioca, rice, pepper, and fruits—tin and tapioca forming articles of export. The town is on a river of the same name, which divides the old Dutch town from the Malay and Chinese quarter, which is on the left bank. The trade once possessed by it has passed away to Penang and Singapore. Originally Portuguese, it has passed backwards and forwards between Holland and England till it finally became British in 1824.

Malacca, STRAITS OF, 480 miles long, with a breadth varying from 30 to 115 miles, separate the Malay peninsula from Sumatra, and join the Indian Ocean to the China Sea.

Malacca Cane, the stem of a slender palm, *Calamus Scipionum*, grown in Sumatra but imported from Singapore and Malacca, is much valued for walking-sticks. Some are a uniform rich brown colour, whilst others are mottled or *clouded*, the colour being produced artificially by smoking the cane.

Malachi, the name borne by one (traditionally the latest in date) of the Minor Prophets of the Old Testament, though it is doubtful whether the name refers to the man or the book. A Hebrew tradition identifies him with Ezra. The book is chiefly taken up with upbraiding the people for falling away from their national customs, and with advocating a return to Jehovah and the Deuteronomic Law.

Malachite, the mineral hydrated carbonate of copper, or carbonate and hydrate combined ($\text{CuCO}_3 + \text{CuH}_2\text{O}_2$). It is occasionally found in oblique crystals, but more usually in stalagmitic, reniform, mammillated, or earthy incrustations, obviously precipitated from solution, having originated by the weathering of native copper or some other copper-ore. It is sometimes fibrous and silky, or rather velvet-like, and presents a great variety of shades of green. Its hardness is between 3.5 and 4, and its density between 3.7 and 4, so that it is both harder and heavier than marble; but, though it takes an excellent polish, it is brittle. It dissolves with effervescence in acids, blackens, and gives off water when heated, colours the blow-pipe flame green, gives a green borax-bead, and can be reduced on charcoal to metallic copper. It occurs in most places where copper-ores occur, and is commonly associated with the allied *blue malachite*, *azurite*, or *chessylite* (q.v.). As it contains about 57 per cent. of copper, it is a valuable, as well as an easily-worked, ore of copper; but the finer varieties are more valuable for ornamental purposes, such as vases, snuff-boxes, brooches, inlaid tables, mantel-pieces, etc. These are obtained mainly in Siberia, especially at Nijni Tagilsk. Ekaterinburg, and at Burra-burra in South Australia.

Malachy, St. (circa 1094–1148), Archbishop of Armagh and Papal Legate, was ordained at 25, and at 30 was Bishop of Connor, after presiding over the monastery of Bangor. When Connor was sacked by the king of Ulster, Malachy founded a monastery in Munster. Celsus, Archbishop of Armagh, though the dignity was considered hereditary in his family, named Malachy as his successor; but the latter, when once he had put the see in order, gave it up in all but name. In 1139, on his way to Rome to seek the pallium, he visited St. Bernard at Clairvaux, and on the way home he brought back with him four Cistercians, who founded the monastery of Mellifont. In 1148 he went again to Clairvaux, and there he died. St. Bernard wrote his life.

Malacopterygii, in Cuvier's classification a division of Bony Fishes (q.v.) in which the rays of the dorsal fins were soft and jointed.

Malacostraca, the division which, with the *Entomostraca* (q.v.), forms the order Crustacea.

Malaga, a maritime district of Andalusia, in Spain, having Cadiz on the W., Granada on the E., the Mediterranean on the W., and containing 2,823 square miles. The land rises rapidly from the coast, and inland are several sierras, the loftiest being that of Alhama (7,000 feet), which separates the district from Granada. The chief river, the Guadalhorce, rises in the Alhama Sierra, and flows W. and S., falling into the sea near the town of Malaga. Another river is the Guadiaro. Lead, nickel, and iron are found, and at Carratraca are sulphuretted hydrogen springs. Much oil and wine are produced and exported, though the phylloxera has injured the wine trade, and the United States now go to California for most of their raisins instead of importing from Malaga. Other products are wheat, oranges, lemons, figs, almonds, and some sugar-cane. The capital (Malaga) is a seaport, 65 miles N.E. of Gibraltar, and has a harbour protected by two moles. The chief industries are the manufacture of cotton, linen, machinery, pottery, and wine, and oil-presses. It is also a great resort for invalids by reason of the dry, sunshiny, but temperate climate which is afforded by the shelter of the mountains. Originally founded by the Phœnicians, Malaga was Moorish till 1478, and a Moorish castle still exists.

Malagasy, collective name of all the inhabitants of Madagascar, who possess linguistic unity to a remarkable extent, combined with considerable physical and social diversity. The substratum of the population is certainly Negro, intermingled in varying degrees with an intruding Malay element, which has everywhere imposed its Malayo-Polynesian speech on the African aborigines. These Malays arrived apparently from the Eastern Archipelago in remote prehistoric times, and possibly in more than one stream of migration, the last comers being the now dominant Hovas of the central plateau, who have best preserved the original Malay type. [HOVAS.] This type is almost effaced amongst the Antankaranas, Betsimisarakas, Antaimoros, and other groups of the east coast, who are far more Negroid in appearance than the Sakalavas, Antifiherenanas, and Mahafalys of the west coast. There are also traces of contact with the Arabs; the Antaimaros even claim to have arrived from Mecca, and amongst them are still preserved some very old manuscripts written in Arabic characters. The Hovas and their southern neighbours, the Betsileos, have alone developed a fully-organised political system, and consequently amongst these European influences have made most progress in recent times. The Catholic, and especially the Protestant, missionaries have been very successful on the plateau, where thousands claim to be Christians, and where European arts and even letters are already widely diffused. But the eastern, the western, and the extreme southern groups are still in the tribal state and, for the most part, at a very low stage of culture. The mild disposition of the Malays, however, has had its effect upon these rude communities, so that nowhere in Madagascar are pagan rites associated with the sanguinary ordeals and other barbarous cruelties so

prevalent in African heathendom. The Malagasy language, spoken with slight dialectic diversity by all the tribes, is a member of the widespread Malayo-Polynesian family, showing close affinities not only with Malay, but also with the forms current amongst the Samoan, Maori, and other South Sea islanders. It has been reduced to writing by the missionaries, under whose control the press of Antananarivo has issued numerous religious and popular works.

Malagrida, GABRIEL (1689-1761), an Italian Jesuit missionary, was sent to Brazil, and on his return went to Portugal. Here he was convicted of complicity in a plot against the king's life, and was burnt alive by the Inquisition.

Malapterurus, a genus of Electrical Catfishes, with three species from tropical Africa. *M. electricus* from the Nile is about four feet long.

Malaria. [AGUE.]

Malayalim, one of the cultivated Dravidian languages [DRAVIDIANS], spoken by over four millions along the southern parts of the Malabar coast, and in general from Mangalore to Cape Comorin. Dr. Caldwell regards it as "a very ancient dialect of Tamil" (*Languages of India*).

Malayo-Polynesian, a term current in popular ethnological writings, although in ethnology it has absolutely no significance. There is no Malayo-Polynesian race, the peoples thus grouped together being quite distinct [MALAYS, POLYNESIANS]; but in philology the expression has a very definite meaning, comprising nearly all the languages of the Indian and Pacific Oceans, except those of Australia and parts of New Guinea. This great linguistic family thus extends with little interruption more than half round the globe, from Madagascar in the extreme west to Easter Island in the extreme east, and from New Zealand northwards to Hawaii. It also comprises on the Asiatic mainland nearly the whole of the Malay peninsula and parts of Indo-China. Its diffusion over this vast area, and amongst races of diverse origin, such as the yellow Malays, the brown Polynesians, and the black Papuans, is one of the unsolved problems of anthropology, and, for reasons that cannot here be discussed, must be referred back to extremely remote times. Malay proper is usually, but wrongly, taken as the typical member of the group. Malay is in a comparatively degraded state, and far more archaic forms occur both in the extreme west (Malagasy of Madagascar), and in the extreme east (Tahiti), and, as shown by Codrington, even amongst the Melanesians (Papuans) of the Solomons and New Hebrides. All attempts to connect Malayo-Polynesian with the Aryan, the Semitic, and other linguistic families have failed, and it must consequently be regarded as an irreducible stock language. Except in the Philippine Islands (Tagala-Bisayan), where grammatical forms have acquired a considerable development, it is characterised by a general absence of inflections and even of agglutinated elements, a puzzling simplicity of structure, and a

feeble phonetic system, conspicuous especially in the eastern Polynesian branch, which has been described as "a language without a backbone." Combinations of two or more consonants are mostly impossible, and all words and even syllables must end in vowels, as may be seen in such geographical names as Tamatave (Madagascar), Paumotu, Tahiti, etc. (Pacific Ocean).

Malays, a main branch of the Mongolic division of mankind, who form either the substratum or the dominant element everywhere in the Malay peninsula, in most of the Eastern Archipelago, in Madagascar, the Philippine Islands, and Formosa. But in this oceanic domain there has been a great intermingling of peoples for ages, and in the midst of so much ethnical confusion it becomes extremely difficult to determine the salient features of the primitive Malay type. Hence the discrepancies in the descriptions, even of scientific observers, although that given by A. R. Wallace may, on the whole, be accepted as, perhaps, coming nearest to the truth: short stature, brown skin, straight black hair, beardless and smooth-bodied, with broad face, flat eyebrows, small nose; reserved but courteous, and of cold, undemonstrative temperament, except when roused to uncontrollable fury under some sudden religious or jealous impulse, when the outburst takes the well-known form of "running amuck." The true Malays are found concentrated chiefly in the Malay Peninsula, in central and south Sumatra, Java, Bali, Lombok, the Borneo coastlands, Tidore, Ternate, and the Banda Islands. They are excellent agriculturists, but most inclined to seafaring as traders, and (till recently) corsairs. Some branches, especially in Java and Sumatra, arrived at a considerable degree of culture at an early period under Hindu influences, and the Bali and Lombok islanders are still Hindus in religion; but all the rest of the civilised Malays have been Mohammedans since the close of the 15th century, except those of the Philippine archipelago, most of whom are Roman Catholics. But the uncivilised groups, chiefly found in the interior of Formosa, the Malay peninsula, North Sumatra, Borneo, Celebes, Halmahera, and some of the smaller Sunda Islands, are still pagans often at a very low stage of culture, head-hunters, cannibals, savages in the strict sense of the word. Many of these peoples, however, although usually spoken of as Malays, are not Malays but Indonesians, rather of Caucasian than of Mongolic type, and have little in common with the true Malays except their common Malayo-Polynesian language. [INDONESIANS.] The Malay branch of this stock language is extremely simple and harmonious, and has obtained currency as a sort of *lingua franca* throughout the whole of Malaysia. It has long been cultivated and is written in the Arabic character, which is little suited for the purpose; but the literature, though copious, lacks originality, having been developed mainly under Hindu and Mohammedan influences. There is, however, a good deal of national poetry as well as folk-lore, legends, and romances, which have at least a decided local colouring. (A. R. Wallace, *The Malay Archipelago*, 1860; Rosenberg

The Folk-lore of the Malays, in *Journal of the Straits Branch of the Royal Asiatic Society*, 1881; Logan's writings; A. H. Keane, *The Malay Race*, in *Encyclopædia Britannica*, xv.)

Malcolm, SIR JOHN, K.C.B. (1767-1833), soldier, statesman, and historian, was born in Dumfriesshire, and entered as a cadet in the Madras army at the age of 16. In 1799 he was present at the siege of Seringapatam, and in 1800 went as ambassador to Persia. The next year he was private secretary to Lord Wellesley, and in 1803 governor of the Mysore Residency. In 1807 and 1810 he again went on missions to Persia, and in 1812 he came to England and was knighted. Then he took part against Holkar and the Pindaris as brigadier-general, and returned to England in 1822. From 1827-30 he was governor of Bombay, and in 1831 he returned to England and entered Parliament. His works are *Sketches in Persia* (1827), *History of Persia*, *Memoirs of Central India*, *Political History of India*, and a *Life of Clive*.

Malcolm, SIR PULTENEY, naval officer, was born in 1768. He took part in Nelson's pursuit of the French to the West Indies, the battle of St. Domingo, and the action in the Basque Roads, and after promotion in 1813 to flag-rank, participated in the attack on New Orleans, and commanded the forces co-operating with Wellington in 1815. He died an admiral and G.C.B. in 1838.

Malcolm Canmore (circa 1030-93), King of Scotland. When his father Duncan was killed by Macbeth in 1040, Malcolm took refuge with his uncle Siward of Northumbria. In 1057 he became king, and, having in 1069 married the sister of Edgar Atheling, he threw in his lot against the Normans. He was eventually ensnared at Alnwick, and there lost his life.

Maldivé Isles, a chain of coral islands and clumps, S.W. of Ceylon, most singularly arranged, and consisting of several hundred islands in 17 groups, of which not 200 are inhabited. The chain has a length of 540 miles—as far as from the Orkneys to Dover—and a breadth of about 40 miles. The people are Mohammedans, but resemble the Singhalese in language, etc. They are under the protection of England, and their head chief resides on the island of Male. Coir, copra, cowries, cocoa-nut, tortoiseshell, and dried bonito are the chief productions and articles of export.

Malebranche, NICOLAS (1638-1715), philosopher, was born at Paris, where his father was secretary to Louis XIII. He was of feeble constitution, and was educated at home. He then studied at the Sorbonne, and in 1660 entered the Congregation of the Oratory. At first he hardly knew his own bent, but a study of Descartes made him adopt the principles of that philosopher, some difficulties in which led him to the doctrine that the perception of a material world or action on it by man is only possible through union with the Deity. These views he expounded in his *Traité de l'Homme* (1664) and *Recherche de la Vérité* (1674) and many other works. He also studied mathematics and physics, becoming honorary member of

the Academy of Sciences in 1699. A collection from his writings was published in two volumes in 1846.

Maleic Acid, an organic acid of composition $C_4O_4H_2$, which crystallises in large prisms, soluble in cold water. It melts at about $130^\circ C.$, and distils at about 160° , undergoing partial decomposition and forming an anhydride. [FUMARIC ACID.]

Malers, a numerous low-caste people of Behar, north-east India, chiefly in the upland Rajmahal valleys, west of the Sontals. Till the middle of the 19th century they enjoyed complete political independence, but since then their chiefs have become pensioners of the British authorities, to whom they are responsible for the maintenance of order. The Malers, who number about half a million, resemble the Gonds in type and dress, and, like them, speak a Dravidian dialect.

Malesherbes, CHRÉTIEN GUILLAUME DE (1721-94), minister of Louis XVI., and counsel for his defence. He was born of a legal family, and in his official capacity at Court had the control of the press, a position which enabled him to advance the cause of the *Encyclopédie*. As minister of the King's Palace in 1775 he did much to abolish *lettres de cachet*. After a time spent in country retirement he was recalled to Court in 1787, soon afterwards again to retire, first to the country, then to Switzerland. He came over, however, to defend the king before the Convention, and was soon after arrested in his country retirement, and guillotined with most of his family.

Malherbe, FRANÇOIS DE (1555-1628), poet, critic, and translator, was born at Caen, and educated at Paris, Heidelberg, and Basel. He became secretary to Henri d'Angoulême in Provence, where he wrote some poor verses. After Henri's death he remained for a time in Provence and Normandy, but a poem sent to Marie de Medici called attention to him. He came to Court, and was presented to Henri IV., and an inheritance from his father enabled him to stay at Paris, where he exercised some influence upon the literature of his time.

Malibran, MARIA FELICITA (1808-36), a celebrated operatic singer, was born at Paris, being the daughter of the Spanish singer Garcia. She made her *début* in London in 1825, and met with a great European success. An attempt, however, to establish opera in New York failed, and she there married a merchant named Malibran, who soon after became bankrupt. She then returned to the stage, and sang in France, England, Germany, and Italy.

Malic Acid is an organic dibasic acid, possessing the composition represented by the formula $C_4H_6O_5$. It occurs in many unripe fruits and plants, notably in grapes, pears, apples (hence name—Lat. *malum* = "apple"), gooseberries, etc., and plentifully in the berries of the mountain ash. From these latter it may be conveniently obtained by pressing and boiling the concentrated juice with milk of lime, and then treating the obtained calcium malate with sulphuric acid. It forms

soluble crystals, which, if heated, lose water, and pass into the two isomeric acids *fumaric* and *maleic* (q.v.). It exists in 3 isomeric varieties, which only differ in their action on polarised light. The ordinary acid obtained as above is laevorotatory. [POLARISATION.] Its reactions show that it is closely related to succinic acid, and that its constitution is represented by $\text{CO}_2\text{H}\cdot\text{CH}_2\cdot\text{CHOH}\cdot\text{CO}_2\text{H}$.

Malicolo, the natives of Urumbao Island, in the New Hebrides, who are typical Melanesians, below the average height, with broad flat nose, black, crisp, and almost woolly hair, and blackish brown complexion, but remarkable especially for their extreme dolichocephaly.

Malignant Pustule. [ANTHRAX.]

Malines (MECHLIN), on the navigable Dyle, a decayed city of Belgium, 14 miles S.E. of Antwerp. It has fine buildings and squares and broad grass-grown streets. The large church of St. Rumbold has a *Crucifixion* by Vandyk, and in the churches of Our Lady and St. John are works by Rubens. The 15th-century town-hall, the cloth hall (now a guard-room), and the Archbishop's palace are buildings of note, and there is a monument of Margaret of Austria. The Archbishop of Malines is Primate of Belgium, and the town has some convents. The lace trade, for which the town used to be famous, has now almost passed away from it, and of the few industries the chief are the manufacture of linen, woollens, beer, and needles. Malines is a railway junction.

Malingering, a term applied to "shamming" or feigning disease.

Malleability is the property possessed by many metals of being flattened out or extended, either under the hammer or between rollers. Gold-leaf furnishes a beautiful example of this, gold being by far the most malleable metal known, and capable of being reduced to films less than $\frac{1}{100000}$ of an inch thick. Silver and copper can be beaten into leaves of great tenuity; tin and platinum can be rolled into foil. The other malleable metals are iron, palladium, lead, nickel, cadmium, sodium, potassium, and solid mercury.

Malleable Iron. [IRON.]

Mallet, SIR LOUIS (1823-90), was for many years connected with the Board of Trade. In 1860 he became acquainted with Cobden, with whom he drew up the tariff in connection with the Commercial Treaty with France. He was knighted in 1868, and from 1874-83, after having served on the Indian Council, he was Permanent Under-Secretary of State for India.

Mallet, PAUL HENRI (1730-1807), antiquary, was born at Geneva, and in 1752 was professor of belles lettres at Copenhagen. In 1755 he published an *Introduction to the History of Denmark*, and in 1756 a second part on the mythology and poetry of the Celts and ancient Scandinavians. This was translated into English under the title of *Northern Antiquities* by Bishop Percy, in 1770. Mallet then

became tutor to the Prince of Denmark, and in 1760 professor of history at Geneva.

Mallophaga, a group of Rhynchota (q.v.), including the Bird-lice. They are all of them parasitic on birds; they live either by sucking the blood or eating the young feathers of the host. Some species, however, occur also on the mammals, in which case they live on the young hairs. The Mallophaga are sometimes included with the true Lice (q.v.), as the order Anoplura.

Mallow, the popular name of the genus *Malva*, which gives its name to the dicotyledonous order Malvaceæ, and of some allied plants such as the marsh-mallow, *Althæa officinalis*. *Malva* comprises about 16 species of herbaceous plants, natives of the northern hemisphere, three of which are British. The leaves are palmately-veined; the flowers, white or pink: there is an involucre of three small bracts below each flower: the five persistent sepals are valvate and united; the five petals, convolute and slightly united; the five stamens, at a very early stage copiously branched and united in a tube (monadelphous), the filaments bearing kidney-shaped one-chambered anthers, which split transversely; and the numerous one-seeded carpels are united in a ring, known to country children as "cheeses," round a short carpophore. The pinkish-purple petals of the common mallow (*M. sylvestris*), known in France as *mauve*, which are marked with distinct *honey-guides*, or lines to guide insects to the honey, have given its name to the aniline dye, mauve. The root of the marsh-mallow, being, like all the group, rich in mucilage, is used in making *guimauve* cough-lozenges.

Malmesbury, JAMES HARRIS, EARL (1746-1820), diplomatist, was born at Salisbury, and was educated at Winchester, Oxford, and Leyden. In 1768, as secretary to the embassy at Madrid, he did a valuable piece of diplomatic service, and in 1772 he was sent as plenipotentiary to Prussia. In 1776 he was sent to Russia, where he firmly established his reputation as a diplomatist. In 1784 he went to the Hague and was instrumental in bringing about the restoration of the House of Orange. His grandson, himself a statesman and author of *Memoirs of an Ex-Minister*, edited the *Diaries and Letters and Lord Malmesbury and his Friends*.

Malmesbury, WILLIAM OF, was an English historian of the 12th century. He was of mixed blood, but his sympathies were Norman. He became a member of the Benedictine Abbey of Malmesbury, and helped Abbot Godefrey make the first library. He became librarian, and precentor, but declined the abbacy. Robert of Gloucester was his friend, and the chronicler was naturally a partisan of Matilda. His chief works are *Gesta Regum Anglorum*, continued in *Historia Novella* and *Gesta Pontificum Anglorum*. Many of his works are unprinted, and others lost.

Malmö, a sea-port of Sweden, on the E. of the Sound, opposite Copenhagen, from which it is distant 16 miles. The town, which is on a level plain,

was once fortified, and still retains the tower where Bothwell was confined. The central square is ornamented with trees, and contains the town-hall. There is daily steam communication with Copenhagen, and, at intervals, with Stockholm, Gothenberg, Lübeck, etc., and a considerable trade in timber, iron, tar, oilcake, bones, grain, flower, butter, eggs. A railway connects the town with Stockholm. Malmö was of importance during the ascendancy of the Hanseatic League.

Malone, EDMOND (1741-1812), was born at Dublin, and educated at the university there, and was called to the bar. Having inherited a fortune, he gave himself up to literature. In 1778 his publication of a supplement to Steevens' *Shakespeare* led to much controversy. In 1790 he brought out his own edition with essays, and this gave great satisfaction. He was a keen critic, and had a hand in exposing the forgeries of Chatterton and Ireland. In 1797 he edited Sir Joshua Reynolds' works. The posthumous *Variorum Shakespeare* (1821) was compiled from his materials.

Malory, SIR THOMAS, an author of the 15th century, is supposed to have been a priest or a knight, and of Welsh blood. He is well-known as the author or compiler of *Morte d'Arthur*. Caxton speaks of his having taken it out of certain books of French, and reduced it to English. It was finished in 1470.

Malpighi, MARCELLO (1628-74), was born at Bologna, and may be looked on as the founder of microscopic anatomy, much of his discovery being also due to his practice of vivisection. His chief discoveries were in the direction of capillary circulation, the nature of the secreting glands, brain-matter, the development of the egg, and the like, and his name has been given to some of his discoveries. He also wrote an *Anatomy of Plants*.

Malpighian Corpuscles, oval enlargements of the lymphoid tissues surrounding the branches of the splenic artery.

Malta, a British possession in the Mediterranean (anciently Melita), 58 miles from Sicily and about 180 from the African coast, and having an area of 91½ square miles, and a population, inclusive of some 7,000 British troops, of about 213,000 souls. Agriculture and maritime trade are the chief sources of employment and wealth. Valetta, the present capital of Malta, possesses one of the best harbours in the world, and, besides being an important naval station, is a commercial port of call. The temperature is in summer semi-tropical, and in winter moderate. The island is full of fine ancient buildings; there is an excellent educational system. The government is carried on by a governor assisted by an executive council, and a legislative council of 9 official and 8 elected members. In 1908-9 the revenue was £457,520, and the expenditure £445,014. The islands were anciently occupied in succession by the Phœnicians, Greeks, Carthaginians, Romans, and Byzantine Greeks—or, in other words, by the powers which, for the time being, had command of the Mediterranean. After

a period of subserviency to the Moors, it was taken in 1090 by Count Roger the Norman, of Sicily. In 1530 it was transferred to the Knights of St. John, who used it as a stronghold of Christianity against the Turks, withstood a great siege in 1565, and held it until in 1798 they were driven out by Napoleon. In 1800 it passed, by capitulation, from the control of France to that of England, after the inhabitants had risen on the French; and in 1814 the ownership of the islands was confirmed to Great Britain by the Treaty of Paris. Malta has since been retained on account of its value as a naval headquarters and as a step upon the shortest route between England and India; and, to render it serviceable in both these capacities, it has been very strongly fortified and armed, and thoroughly equipped as a first-class naval arsenal. Valetta itself is protected by an enceinte with numerous bastions, and by forts Saint Elmo, Ricasoli, Tigné, Citta Vittoriosa, Sliema, Kaura, Ghoslien, St. Thomas, Monsciar, and Delamara. For governmental purposes, Malta includes the islands of Gozo and Comino, as well as some other islets. The island of Comino has a battery opposite fort Ghoslien, and the island of Gozo has several works. There are also large docks and pontoons, and naval and military depôts and stores of all kinds.

The *inhabitants* of Malta are the issue of numerous interminglings—aborigines of unknown stock, Phœnicians, Greeks, Romans—all of whom were strongly Arabised during the occupation of Sicily by the Saracens. The Maltese language, still spoken almost exclusively by the peasantry, contains about 70 per cent. of Arab words, although the structure is rather Italian than Semitic. It is spoken in its greatest purity in Gozo, and is obligatory in all the schools. The people are a fine vigorous race, of medium height, with black hair and eyes, and brown complexion. They are a gay, sociable, frugal, and industrious people, increasing so rapidly that many are compelled yearly to emigrate, chiefly to Algeria, Tunis, Egypt, Sicily, and Italy. Including these emigrants, Maltese is at present spoken by about 250,000 persons as their mother tongue; but it is little cultivated, and even in Malta nearly all the periodicals are Italian.

Maltebrun (MALTHE KONRAD BRUNN), the Danish geographer, was born in Jutland in 1775. He was obliged to leave Copenhagen in 1800 on account of his revolutionary sympathies and lived in Paris the rest of his life. There he supported himself by journalism and teaching, and published his *Précis de la Géographie Universelle* (reissued in 1872), his *Annales des Voyages*, and his *Géographie Mathématique, Physique, et Politique*. He died in 1826.

Malthus, THOMAS ROBERT (1766-1834), the onomist, was born near Dorking. At Cambridge he became ninth wrangler and fellow of Jesus. He then took orders, and travelled in France, Switzerland, and the north of Europe. Immediately after leaving Cambridge he had published anonymously (1798) the *Essay on the Principle of Population*,

which in 1803 he acknowledged and extended. From 1805 until his death he was professor of political economy at the East India College at Haileybury. Malthus never approved of so-called Malthusian practices.

Malting, the artificial production of germination in grain; a preparation for brewing.

Maltose is a member of the sugar group of carbon compounds, and possesses the composition represented by $C_{12}H_{22}O_{11} + OH_2$. It is produced by the action of diastase or malt extract upon starch, and is so formed in brewing during the processes of malting. It is also the variety of sugar which results from the action of the saliva and the pancreatic juice upon starchy foods during digestion. It is a white crystalline solid, readily soluble in water. By boiling with dilute acids it becomes converted into dextrose (q.v.), which substance it so closely resembles in its chemical properties that considerable care is required for their discrimination. It ferments under the influence of yeast, yielding the usual products of alcoholic fermentation. [FERMENTATION.]

Malvern, GREAT, a watering-place on the Worcestershire side of the Malvern Hills, is in great repute for the purity of its air and the abundance of its water, which is largely used by invalids at the numerous hydropathic establishments. Malvern College, founded in 1865, has about 600 boys. The highest point on the Malvern Hills, where there are several ancient camps, is the Worcestershire Beacon, 1,395 feet in height. West Malvern is in Herefordshire. Pop. (1901), 16,448.

Mamelucos, the name given in Brazil to the offspring of Portuguese fathers and Indian, especially Guarani, mothers. They are generally a finer race not only than the natives but even than the whites, far surpassing them in vigour and enterprise.

Mamelukes, a body of Egyptian cavalry, so called (Arab. *mamlūk* = "purchased slave") because the original members were slaves of various nationalities sold by Jenghiz Khan to the Sultan of Egypt in the 13th century. They soon (about 1250) seized the government, and made one of themselves sultan or Mameluke Bey. Their rule was maintained until 1517, when they were overpowered by the Turkish sultan Selim I., after which they formed part of the Egyptian army until in 1811 Mehemet Ali had most of them massacred, because they were too powerful.

Mammals, the name (from the Latin *mamma* = "the breast") given by Linné to the highest class of vertebrates, from the fact that the females nourish their young with milk secreted by the mammary glands. The class is a very large one, and includes forms differing enormously in point of size. According to Sir William Flower, "the extremes are marked, on the one hand, by the whale known as Sibbald's Rorqual, which attains a length of 80 feet and a weight of nearly as many tons, and, on the other, by the Pigmy Shrew and the Harvest Mouse,

which can climb a stem of wheat." At the head of the class stands Man, and, like Man, very many of the lower forms are terrestrial, as the horse and the cow; others are arboreal as the squirrels and monkeys, or burrowers as the moles and many rodents; a few are aerial, as the bats, while others are aquatic as the whales, seals, and manatees.

There are usually four limbs, though the posterior pair, corresponding to the human legs, are absent in the whales, manatees, and dugongs, or only represented by small vestigial bones. The fore limbs are always present; but may be modified into wings (as in the bats), into spade-like organs (as in the moles), or into paddles in aquatic mammals. The vertebræ are generally prolonged into a caudal portion or tail, which may be prehensile, as in the New World monkeys; a swimming organ, as in the Cetaceans and Sirenians; or it may be used to express emotion as in the dog; or to drive away insects as in the hoofed animals generally.

The skin is generally more or less covered with hair (q.v.), which differs very widely in character, being soft and velvety (as in the mole), bristly in the pig, and spine-like in the hedgehog and porcupine. The Cetaceans are practically hairless, and the want of the usual skin covering is supplied by a thick layer of blubber immediately beneath the skin. In very many forms, especially in those from cold climates, the hairs are of two kinds: one long and stiff, the other short and soft. This is notably the case with the fur-seal; the seal-skin of commerce being the skin of the animal after the long hairs have been removed.

Mammals differ from birds and reptiles in having two condyles instead of one for the articulation of the occipital bone to the vertebral column. The lower jaw or mandible consists of two branches ossified in front as in Man, or united by a ligament. The brain has two hemispheres, united by a commissure, the *corpus callosum*. The heart is four-chambered, the pulmonary and systemic circulations are distinct, the red blood-corpuscles are without a nucleus and, except in the camel family, circular in form. The body cavity is divided into a thoracic and abdominal portion by a muscular partition called the diaphragm or midriff. Respiration is effected by lungs, and the visceral arches of the embryo never carry gills, as do those of fishes and Amphibians. With the exception of Monotremes (q.v.), which are oviparous, the young are brought forth alive. Mammals form three sub-classes:—

I.—Prototheria:

Order 1.—Monotremata. [MONOTREMES.]

II.—Metatheria:

Order 2.—Marsupialia. [MARSUPIALS.]

III.—Eutheria. True, or Placental Mammals, the Monodelphia of De Blainville. There is a single uterine cavity opening into a vaginal passage, always distinct from the rectum. During intra-uterine life the young are organically connected with the parent by means of a placenta (q.v.), through which the blood of the mother passes to nourish and purify that of the foetus.

Order 3.—Edentata (sloths, ant-eaters, armadillos, pangolins, and aardvarks).

- " 4.—Sirenia (manatees and dugongs).
- " 5.—Cetacea (whales, dolphins, and porpoises).
- " 6.—Ungulata (hoofed animals).
- " 7.—Rodentia (rodents).
- " 8.—Carnivora (cats, dogs, bears, and seals).
- " 9.—Insectivora (shrews, moles, and their allies).
- " 10.—Chiroptera (bats).
- " 11.—Primates (lemurs, apes, and man).

With regard to the origin of the class, opinions are divided as to whether they sprang from a Reptilian or an Amphibian stock. It has been suggested that from the last named source came the earliest mammals, and the extinct Anomodont reptilians in divergent lines. Professor Mivart thought that the monotremes may have had a Reptilian and the marsupials an Amphibian ancestry.

At the base of the Secondary System the oldest known mammalian remains are found. The chalk of North America has yielded many forms, and in 1891 the first mammalian remains from the European Cretaceous were obtained in the shape of a tooth of *Plagiaulax*, from the Wadhurst Clay near Hastings. All these remains are very small, and belong to the Implacental Mammals (monotremes and marsupials). It is not till Eocene strata that Placental Mammals are certainly met with, and these are of much more generalised type than those living at the present day.

Mammary Gland. [BREAST.]

Mammoth, a name of Russian origin, applied to *Elephas primigenius*, the best known of fossil elephants. It occurs in Pleistocene rocks, and was undoubtedly contemporaneous with man in Europe, as proved by the etched portrait of the animal on a piece of its own tusk found in the cave of La Madelaine in the Dordogne. It had a remarkably wide geographical distribution, being found in Ireland, Scotland, the river-gravels of almost every county of England, Europe as far south as Santander in Spain and as Rome, North America, and especially Siberia. The Liakov and Bear Islands are said to be almost made up of its bones; and in several instances the entire body, with the flesh, the skin, the reddish wool and long hair, and even the eyes, has been found frozen in the soil of the tundras of northern Siberia. The tusks of these fossil elephants were brought regularly to Khiva in the 10th century, and are now taken to China and, *via* Archangel, to London. They are sometimes nine or ten feet long and remarkably curved. The grinding teeth consist of from 3 to even 30 narrow plates, and in these and other skeletal characters the mammoth most nearly resembles the Indian elephant; but its wool and hair were obviously adaptations to a glacial or subglacial climate.

Mammoth Cave (1) is in Edmondson county, near the Green River, in the centre of Kentucky. It is 10 miles long, from 40 to 300 feet wide, and its highest shaft, Lucy's Dome, is 300 feet. It is divided into numerous chambers and grottoes, in which are to be found many interesting blind fish and crustaceans. Branches of a subterranean river run through some of these. (2) There is also a large

cavern called by this name, containing a subterranean lake, in California 12 miles from San Andreas.

Man, ISLE OF (Celt. *Man* = "district"), is in the Irish Sea, 27 miles from the nearest points of England and Ireland, but 11 miles nearer Burrow Head, Wigtownshire. It is 31 miles long and 13 broad in the widest part, having a total area of 209 square miles. The Calf of Man, 3 miles to the south-west, is a fertile island 800 acres in extent. In 1266 Magnus, King of Norway, ceded his rights over it to Alexander III. of Scotland, on whose death the inhabitants placed themselves under the protection of Edward I. of England. By him and his successors temporary grants were made to English nobles, who took the title of king, and from 1403 to 1651 the Stanleys, Earls of Derby, ruled it. Owing to the royalism of the Countess it was taken from them by the Parliament, but was restored at the Restoration, and in 1735 passed by descent to the Duke of Athol. Thirty years later the sovereignty of the island was purchased by the British Crown; but it was not until 1829 that, in pursuance of an Imperial Act passed four years before, full rights were obtained over it by further purchase. Man still retains a semi-independence, having its own Governor and Parliament called the Tynwald, the latter consisting of a council of eight and a House of Keys, or Representatives. In 1866 popular election was enacted, and in 1880 household suffrage was established and women were enfranchised. Laws are still promulgated on the Tynwald Hill in Manx as well as English, but the Celtic dialect is now almost obsolete. The bishopric of Sodor and Man, traditionally founded by St. Patrick, consists now of the Isle of Man only. The climate of the island is very pleasant, and much of the scenery picturesque. A range of mountains runs from north-east to south-west, Snaefell (2,024 feet) being the highest point. The herring and cod fisheries are an important industry, and the lead-mines are very rich. Zinc and other minerals are also found, much cattle is pastured and exported, and some corn is grown. The tailless cat of Man still exists, but the Manx puffin is extinct. Man is rich in relics of remote antiquity—the Tynwald Hill in the centre of the island, Castle Rushen, and Peel Castle being the most notable. The chief towns are Douglas, Peel, Ramsey and Castletown, the old capital. Pop. (1901), 54,758.

Manasseh (Heb. = "causing to forget"). 1. Elder son of the patriarch Joseph; territory on both sides of the Jordan was awarded his tribe.

2. The 13th king of Judah, succeeded his father Hezekiah when a child in 697. In the course of a long reign he restored the heathen worship and was carried captive to Babylon.

Manatee, any individual of the Sirenian genus *Manatus*, with three species—*M. australis*, from the rivers on the west coast of tropical South America, *M. inunguis*, confined to the Amazon and Orinoco, and *M. senegalensis*, from West Africa. The maximum length may be put at about eight feet, and the colour is bluish-grey above, lighter below. They

frequent estuaries and lagoons, and feed on aquatic vegetation. The manatee differs from the dugong (q.v.) in the incisors, in both sexes, being replaced in the adult by horny pads, and in the greater number of the molars. The tail is rounded, and there are rudimentary nails on the digits. The flesh is eaten, and fat yields a valuable oil, and the skin is made into leather. Specimens have been exhibited at the Brighton Aquarium and the Zoological Gardens, Regent's Park.

Mancha, LA. [CASTILE.]

Manche, LA (Fr. "sleeve"). 1. The French name for the English Channel.

of Manchester by the opening of the Bridgewater Canal in 1761; but the modern epoch in its history dates, of course, from the subsequent introduction of machinery. In the first half of the 19th century the population more than quadrupled itself, and from the "largest village in England" it became the third or fourth town after the lapse of little more than a hundred years. In 1830 the Manchester and Sheffield Railway was opened; in 1832 Manchester became a parliamentary, and in 1838 a municipal borough; and soon after the formation of the bishopric in 1847 it was declared a city. The part which it took in the abolition of the Corn Laws, besides increasing its



THE TOWN-HALL, MANCHESTER.

Cassell & Co., phot.

2. A department in the N.W. of France, having the Channel on every side except the east. It has an area of 2,289 square miles, the large part of which is arable land. There are extensive apple orchards, from the produce of which much cider is made, and valuable granite quarries; and fine breeds of horses, cattle, and sheep are reared. The capital of the department is St. Lô, but Cherbourg is the most important town. Cape La Hague is the north-western point.

Manchester, England, is 31 miles E.N.E. of Liverpool and 187 miles N.W. from London by railway. It stands on the east bank of the river Irwell, being connected with Salford on the other side by numerous bridges. It was an important Roman station known as Mancunium, the Saxon name being Manceastre. The early history of the city is obscure, but it is known to have had some importance as a trading town as early as the 14th century. A fresh impulse was given to the increasing trade

commercial importance, also made it a political centre; while the foundation of Owens College in 1851, the nucleus of the Victoria University (q.v.) rendered it the educational headquarters of northern England. By the Reform Bill of 1867 Manchester gained two additional members; by that of 1885 the area of the political borough was increased, and it was divided into six single-member constituencies, Salford having also three of its own. Besides the tramways, the supply of water and gas is absolutely in the hands of the Corporation; and the town-hall, designed by Waterhouse and finished in 1883, is the finest municipal building in the world. Manchester and Salford with their environs draw their water supply partly from Blackstone Edge, and partly from Thirlmere Lake, in Cumberland. The chief buildings are the cathedral or "Old Church," which dates from 1422 and is celebrated for the beauty of its choir; the Roman Catholic cathedral of St. John's; the Royal Exchange, finished in 1874, having the largest exchange-room

in Europe; the Assize Courts, designed by Waterhouse and finished in 1864; and the Free Trade Hall. There is a large and important technical school, and the Technical Instruction Act has been adopted. Manchester grammar school was founded in 1515, and is now rich in endowments, while the Hulme foundation also provides higher education. Besides the great cotton industry, woollen and silk fabrics are largely manufactured, and the making of machinery and chemicals employs thousands of people. The factories are almost all in the environs, the main part of the city being occupied by warehouses and offices. Manchester is, of course, a most important railway centre. The construction of the Ship Canal in 1887-91, connecting it with the sea, put the finishing touch to its immense commercial advantages. Pop. (1908) 349,251.

Manchester, a rising city in New Hampshire, United States, situated on the west bank of the Merrimac river, was settled in 1722, and assumed its present name in 1810. It has been the seat of a Roman Catholic bishop since 1846. It has important cotton and woollen manufactures, and machines of all kinds are also made. Water-power for the mills is obtained from the Amoskeag Falls through canals.

Manchester, EDWARD MONTAGU, second EARL OF (1602-71), is remembered in history as the Lord Kimbolton who was charged with treason in January, 1642, in company with the Five Members of the House of Commons. During the Civil War he commanded the Parliamentary armies first in the eastern counties, and afterwards at Marston Moor and the second battle of Newbury; but he was not energetic enough to suit Cromwell, and was deprived of his command by the Self-denying Ordinance. He afterwards opposed the trial of Charles I., and was made Lord Chamberlain for his services in connection with the Restoration and as a leading Presbyterian. His grandson was made a Duke in 1719 for his steadfast Whiggism.

Manchu, a main branch of the Tungus division of the Mongolo-Tatar race, whose proper name is *Niuchi*; the term *Manchu* was till the 17th century restricted to a single tribe in the White Mountains, but was extended to the whole of the region north of China, now known as Manchuria, after its reduction by Taitso, founder of the present Manchu dynasty in China (1643-44). But since the conquest the great bulk of the inhabitants of Manchuria have become Chinese, and of the primitive Manchu stock probably not more than half a million survive anywhere. The Abbé Huc went so far as to say that "at present the Manchu nationality is annihilated; one may search in vain in Manchuria for a single town or village which is not exclusively Chinese. All local colouring has been completely effaced, and, with the exception of a few nomad groups, nobody any longer speaks Manchu." In the primary schools Chinese alone is taught, and the national language would have already disappeared but for the fact that it is specially studied in China itself in consequence of

the Manchu origin of the reigning family. It has thus become one of the classical languages, which competitors for the higher Government offices are obliged to learn, and which is indispensable to all students of recent Chinese history. Manchu is a Tungus dialect noted for the regularity of its grammatical structure, and, like Mongolian, written in vertical columns from left to right in a peculiar script based on the Syriac, which was introduced into Mongolia in the 13th century.

Manchuria, the country of the Manchus, is that part of the Chinese Empire which lies between Mongolia and Corea, having the river Amur as its northern boundary. The total area is nearly 400,000 square miles, and it is divided into the provinces of Tsitsihar or Helung-tsiang (the northern portion), Kirin or Central Manchuria, and Leaou-tung or Moukden, the southern division. With the exception of the district between Moukden and the Gulf of Leaou-tung, Manchuria is very mountainous. The chief ranges are the Shan-a-lin or "Long White Mountains," which extend from the Amur to the Gulf Leaou-tung, and the Chingan Mountains in the north. They are interspersed with fertile valleys, and the scenery here is very beautiful. The three chief rivers are the Sungari, which rises in the Shan-a-lin, and, after joining the Nonni, flows in a north-westerly direction till it reaches the Amur; the Hurka, which joins the Sungari at San-tsing; and the Usuri, still farther towards the east. The Sungari is navigable as far as Kirin, but the Hurka is impeded by torrents. The chief productions of the soil are millet, poppies, maize, beans, and rice. The not inconsiderable mineral resources of the country have not yet been taken advantage of to any large extent, though the gold-mines have begun to be worked. The chief exports are beans, silk, and fur; and the making of opium and furniture, with distilling and tanning, are the principal industries. The Manchurians long maintained a struggle with the Chinese, but in 1644 the grandson of their great chief, Narhac-chu, ascended the throne of China and founded the Chin dynasty. The chief towns are Moukden (or Shing-yang), Kirin, Tsitsihar, and Niu-chwang or Ying-tzu, the chief port. The attitude of Russia towards Manchuria was one of the chief causes of the Russo-Japanese War which broke out in 1904. The Japanese, having driven the Russians out of Corea, steadily advanced through Manchuria, which was the scene of much fighting. In 1905 the Russians were still forced back, and the battle of Moukden resulted in their being driven further north. Peace was declared in 1905, and Russia undertook to evacuate Manchuria and restore it to China. [CHINA.]

Mandseans, NASOREANS, or SABIANS, a small religious sect dating from the early centuries of Christianity, which professes a kind of Gnosticism mingled with Judaistic and Zoroastrian elements. Some of them still survive at Sug esh-Shia.

Mandaic, a corrupt Syriac dialect in which are written the Genzâ (Codex Nasaræus) and other writings of the Nazarenes or Mandæans (q.v.). The word *Manda* is referred to root *yada*, "to know," by Dr. A. J. Brandt, who gives the best account of these people in *Mändaische Religion*, etc. (Leipzig, 1889).

Mandalay, the chief town of Upper Burma, is situated a little to the east of the Irawady, near Amarapura, the old capital, and some 30 miles north of Ava. From 1860 to 1886 it was the capital of Burma, but by the treaty of the latter year it fell into the hands of the English, by whom it had been captured in 1885. The chief object of interest in the place is the Aracan Pagoda, containing a brass image of the Buddha 12 feet in height. Silk-weaving, carving, and gold- and silver-working are the chief industries. The year of the British occupation was marked by a great fire and disastrous floods. [BURMA.]

Mandamus ("we command"), a high prerogative writ issued in the King's name from the High Court of Justice. It is in the nature of a command, and may be addressed to any person, corporation, or inferior Court of Judicature within the kingdom, requiring them to do something therein specified which appertains to their office, and which the court holds to be consonant to right and justice. It is used mainly for public purposes and to enforce performance of public rights or duties. It, however, is also sometimes used to enforce private rights when they are withheld by public officers.

Mandans, North American aborigines, a distinct branch of the Dakotan family, who formerly lived in well-constructed huts in the Missouri valley round about Fort Berthold, whence they ranged northwards to Canada. *Mandan* appears to be a corrupt form of the Dakotan *Matani* or *Mawatani*, their own original name being *Numakaki*, "Men." They were allies of the neighbouring Arikarees and Paunches (Gros-Ventres), and noted especially for the frightful ordeals (described by Catlin) which the young men had to undergo during the ceremonies of initiation into the rank of hunters and warriors. The Mandans are now reduced to about 250, all grouped with the Hidatsas in Fort Berthold Reservation, North Dakota. (Catlin, Matthews, Powell.)

Mandara, MANDALA, a Negro people of East Sudan, conterminous on the north with the Shirs of the Bahr-el-Arab; appear to have come originally from Baghirmi, whence they migrated to escape from the slave-hunters from Lake Chad. At present nearly all are Mohammedans, and at the beginning of the late Mahdist revolt they took part with the Baggara Arabs and with the Nuers in their attacks on the Egyptian stations of the Equatorial Province.

Mandeville, BERNARD DE (1670-1733), a satirical writer, was the son of a Rotterdam physician. He took his own degree in medicine at Leyden in 1691, but soon afterwards came to London, where he practised as a physician for many years. In 1705 he published a sixpenny pamphlet

under the title of *The Grumbling Hire; or, Knaves turned Honest*, which ridiculed the charges of political corruption then rife. In 1714 this was bound up with *An Inquiry into the Origin of Moral Virtue* and *Remarks* on the former work; and these, together with an *Essay on Charity Schools* (in which philanthropy was lightly treated) and *A Search into the Origin of Society*, were brought out together in 1723 under the title of *The Fable of the Bees*. The leading idea of the whole is that "private vices are public benefits."

Mandeville, JEHAN DE, popularly called SIR JOHN MANDEVILLE, the name by which the compiler of a book of travels called himself. The book itself was in all probability originally in French, though there are early Latin editions. The first MS. must have appeared between 1357 and 1372. The first English version was made early in the 15th century and was printed by Wynkyn de Worde in 1499, the French text having appeared in type in 1480. The compiler, who may have been a physician named Jehan de Bourgoigne, not only draws largely upon his imagination, but borrows the bulk of his matter from other works such as those of Friar Odoric (1330) and John of Plano Carpini, a Franciscan monk.

Mandingans, the dominant people of west Sudan, whose innumerable branches and tribal groups occupy the greater part of the region between the Joliba (Upper Niger) and the Atlantic coast; many also have long been settled amongst the Tuaregs (Berbers) of south-west Sahara beyond the Senegal river. Some are pure negroes, and still pagans in a low state of culture; but the great majority are Negroid (half-caste Negroes and Berbers), who at an early date embraced Islam, founded powerful Mohammedan empires, such as Mali (or Melle) and Guiné in west Sudan, besides the more recent states of Moasina, Bambara, Kong, and others in the middle Niger basin and about the head-waters of the Volta and other streams flowing to the Gulf of Guinea. All these may be regarded as semi-civilised, having developed a certain degree of culture under Moslem influences, although none have adopted either Arabic or Berber languages, but still everywhere speak more or less divergent forms of the original Mande Negro tongue. The term *Manding* (properly *Manding'ke*, i.e. "People of Manding") has reference to the district of that name on the Upper Niger, which is claimed to be the cradle of the race. The capital of this district was Mali, which gave its name to the vast empire of Mali overthrown about 1500 by the Sonrhay Sultan, Omar Askia; but the name still survives in the national traditions, and from it the Upper Niger group call themselves *Mali'nhé*, i.e. "People of Mali," in contradistinction to the *Soninké* of the Senegal basin, the *Jalonké* of Futa-Jallon and the Bamana of Bambara, these being the other more important historical Mandingan nations.

Mandoline, a musical instrument of the lute class, with six metallic strings (single or double) stretched on a stout, almond-shaped body, and

with many frets on the neck. It is played with a plectrum, and has generally a compass of about three octaves upwards from G below middle C. It has a pleasant tinkling *timbre*.

Mandrake (*Mandragora officinarum*), a handsome but poisonous plant belonging to the Solanaceæ and nearly related to the deadly nightshade. It is a native of the Mediterranean region, and has ovate radical leaves, bluish-purple bell-shaped flowers, one on a stalk, and a fleshy, orange, berry-like fruit. It is truly emetic, purgative, and narcotic, and was anciently used as an anæsthetic, as is alluded to in Shakespeare. From still earlier times the fancied resemblance of the fleshy and often forked root to the human body gave rise, under the doctrine of signatures (q.v.), to a mass of superstition. It was a potent love-philtre and of service in pregnancy, the *dudaim* of Genesis (chapter xxx.) being undoubtedly this plant. It was potent in all kinds of witchcraft, curing demoniacs, according to Josephus, and even among the Germans being credited with prophetic powers, so that, as might be supposed, the mere possession of the root was lucky. When pulled up, however, it shrieked, and the hearer was liable to madness and the gatherer to death, so that a dog was tied to the plant and the ears were stopped. At the present day the roots of the white bryony (*Bryonia dioica*) are sold by quacks as mandrakes.

Mandrill (*Cynocephalus maimon*), a large baboon from tropical West Africa, partially insectivorous in diet. The general hue is olive-grey, but the face is striped with blue and scarlet, and the seat-pads are blood-red.

Manes Worship, a particular form of ancestor worship (q.v.) practised in ancient Rome. [LARES.]

Manfred, a natural son of the Emperor Frederick II. and Bianca Lanzia, was born about 1231. He was created Prince of Tarentum by his father, and at his death Regent of the two Sicilies during the absence of his half-brother, the Emperor Conrad IV. He defended Sicily and Apulia against Pope Innocent IV., and in 1258, when Conradin, son and successor of Conrad IV., was supposed to have died, was proclaimed king. Even when assured of the death of his nephew, he refused to surrender his power, though protesting he would do so on his death; and he was excommunicated by Pope Alexander in 1259. Manfred defeated the troops of the Holy See at Monte Aperto, but was again excommunicated in 1261. Two years later his crown was offered by Urban IV. to Charles of Anjou, and a "crusade" was proclaimed, the result of which was the defeat and death of Manfred at Benevento in 1266.

Mangalore, a seaport on the Malabar coast of Hindostan about 100 miles north of Calicut. It is the administrative headquarters of the South Kanara district, and has a large export trade, chiefly in coffee. It was the headquarters of Hyder Ali's navy, and was afterwards taken by Tippoo

Sultan, but was retaken by the British in 1799. Mangalore is the seat of a Roman Catholic bishop, and also of the Basel Lutheran mission.

Mangals, a branch of the Afghans, upper Kuram Valley and Zurmat district; six main divisions: Miral, Khajari, Zab, Margae, Kamal, Lajhwar; claim to be of Mongol descent, but now speak Afghan exclusively, and are all Sunnite Mohammedans.

Manganates. [MANGANIC ACID.]

Manganese is a metallic element which occurs naturally only in the combined state. The chief of the manganese minerals are the oxides, e.g., *Pyrolusite* or *black oxide*, MnO_2 ; *braunite*, Mn_2O_3 ; *hausmannite*, or *red oxide*, Mn_3O_4 ; the carbonate, *white manganese*, $MnCO_3$; while it also occurs in certain iron ores, and in small quantities in many siliceous minerals. Pyrolusite, the black oxide of manganese, was known in early times, and used in glass-making. It was, however, supposed to be a compound of iron, and was much confounded with magnetic iron ore. The distinctive character of the manganese compound was shown at the close of the 18th century and the metal itself obtained. It may be prepared by strongly heating an intimate mixture of the oxide with charcoal. It is then formed as a reddish white metal, brittle, and hard enough to scratch glass. It has a specific gravity of 8, and atomic weight 54.8. It decomposes water with evolution of hydrogen and hence oxidises rapidly in air and should be kept under naphtha or in sealed tubes. It forms a number of oxides and two definite series of salts, the *manganous* salts corresponding with the oxide MnO , and *manganic* salts corresponding to the oxide Mn_2O_3 , while some salts derived from the dioxide MnO_2 are also known. The higher oxides possess acid-forming properties, and give rise to two acids, *manganic acid* (q.v.) and *permanganic acid*. It is usually estimated quantitatively as the carbonate or red oxide Mn_3O_4 . The pure metal finds no application for industrial purposes, but its oxides are employed in glass-making and the manufacture of chlorine. Alloys with iron, *spiegeleisen* and *ferromanganese*, are also largely used for the production of steel, as the presence of small quantities of manganese in the iron improves the quality of the steel obtained and greatly increases its tenacity.

Manganic Acid. When manganese compounds are fused with nitre a green mass results which dissolves in water, yielding a solution which passes through a variety of colours from green to red. It appears to contain an acid, *manganic acid*, H_2MnO_4 , which is very unstable and rapidly decomposes. Many of the salts, termed *manganates*, are known. The potassium and sodium salts form green crystals isomorphous with those of the corresponding sulphates, and barium manganate exists as an emerald green crystalline powder employed to a small extent as a pigment.

Manganite, the hydrous sesquioxide of manganese ($Mn_2O_3 + H_2O$), an ore of manganese and a source of oxygen, though, owing to its

smaller percentage (27·5) of oxygen, of less value in the latter application than pyrolusite (q.v.). It occurs in sub-metallic, iron-black crystals, which are rhombic prisms, and has a hardness of 4 and specific gravity of about 4·3. It is found at various places in Cornwall, the Mendip Hills and elsewhere.

Manganja (MAGANJA), a large Bantu nation, whose territory lies mainly between the Zambesi and the Shiré emissary of Lake Nyassa. When first visited by Livingstone they formed numerous petty states, whose chiefs recognised a paramount lord, Rondo or Rundo, to whom they paid a small yearly tribute, and who also claimed one of the tusks of all elephants killed in their territory. But since the arrival of the Makololos these relations have been altered, and at present the Manganjas acknowledge the British authorities in Nyassaland. [MAKOLOLO.] The Manganjas are an industrious people, good agriculturists, cotton-weavers, and workers in iron. Many attend the Scotch mission stations in the Shiré district, and their Bantu language (Chi-Nganja) has been reduced to written form by the missionaries.

Mange, a disease affecting the skin of dogs and other animals, due to a parasite resembling the itch mite which attacks the human subject. [ITCH.] Treatment consists in the enforcement of cleanliness of the skin, and in the use of ointments, such as sulphur ointment, with a view to destroying the parasite.

Mango (*Mangifera indica*), a small tree belonging to the terebinth family, indigenous to tropical Asia, but now cultivated throughout the tropics. It has scattered entire leaves and panicles of small pink or yellow flowers. Though its glossy leaves make it valuable for shade, it is chiefly valued for its drupaceous fruit, which varies considerably in size and flavour, though it seems always to have a slight flavour of turpentine. In an unripe state it is used in pickles; but in India is largely eaten when ripe as a dessert fruit. Containing gallic acid, it will stain a steel knife blue. The seeds, bark and resin have some medicinal value, apparently as astringents, and the wood, though soft, is used as timber.

Mangold-wurzel, a variety of beet (q.v.), *Beta vulgaris macrorrhiza*, largely grown as food for cattle, being almost as nutritious as swedes (q.v.), and not, like them, liable to the attacks of the turnip beetle. It flourishes on the light soils of our southern counties, where it is too hot and dry for the turnip.

Mangoni (ANGONI), a widespread Bantu people, who occupy the whole of the plateau stretching west from Lake Nyassa. They came originally as conquerors from Zululand, and still speak Zulu mixed with many terms borrowed from the languages of the tribes reduced by them. Before the establishment of an orderly government by the British Chartered Company the Mangoni frequently raided the shores of the lake, and even extended their excursions into the Shiré basin, plundering

and murdering the Manganja and carrying the women and children into captivity. (James Stewart, *Lake Nyassa, Proceedings of the Royal Geographical Society*, 1882.)

Mangosteen (*Garcinia Mangostana*), a small tree belonging to the gamboge tribe, native to the Moluccas, but now cultivated elsewhere. It has large, glossy, leathery, entire leaves. The fruit, esteemed as one of the most delicious in the world, resembles a small orange, but is reddish-brown, becoming chestnut. Its thick rind yields an astringent juice containing gamboge (q.v.), and its pulp is snow-white with a flavour compared to a combination of peach and pine-apple. It is quite wholesome, and is recommended in cases of fever.

Mangrove, the name of a group of trees mostly belonging to a small dicotyledonous order, the Rhizophoraceæ, but applied also to the white mangroves (*Avicennia*), which belong to the ver-



MANGROVE.

bena family. Mangroves grow on estuaries, salt marshes, and muddy shores along the coasts of both hemispheres within the tropics, flourishing in salt water, sending down numerous adventitious rootlets from their branches to the mud, and even tap-roots, from the seeds in the fruit still on the trees. Some have hard durable wood, and the bark is used in tanning. The common mangrove is *Rhizophora Mangle*.

Manguianes, a people of the Philippine archipelago, dominant in the interior of the large island of Mindoro, where they continue to defy the Spanish authorities. Some, however, have entered into friendly relations with the neighbouring Christian communities, while the great bulk are either nominal Mohammedans or pagans. These are the people of whom Careri related, on the report of the Jesuits, that they were furnished with tails four or five inches long. They appear to be of Malay stock crossed with Negrito blood.

Mania. [INSANITY.]

Manichæans, MANICHEANS, MANICHEES, heretics who in the 3rd century followed an Oriental mystic, Mani or Manichæus. Their tenets were a strange mixture of Christianity with Gnosticism, Buddhism, Zoroastrianism, and other systems. They worshipped the principle of darkness and evil

as well as that of light and goodness. They were ascetics, but are charged with gross immorality. The sect did not die out until the 7th century, and much of its doctrine survived in the sects of the Paulicians, Albigenses, etc., grouped as New Manichæans.

Manila, or MANILLA, the capital of the Philippine Islands, stands at the back of a bay in the south-west of the island of Luzon. The river Pasig divides it in two parts, the southern consisting of the old town, founded by Legaspi in 1571, whilst on the northern bank is the trading and fashionable part of the city. The cathedral and archbishop's palace, as well as the university, observatory, and arsenal, are in the Plaza de Manila, or old city. The harbour is unsafe during the monsoons, and large vessels have to shelter in the naval port of Cavité. The climate generally is very hot, but not unhealthy, and, besides the monsoons, there are not unfrequently terrible earthquakes and hurricanes. For this reason the houses are generally built of wood. No glass is used, and the streets are lighted by kerosene oil lamps. The greater part of the population consists of the native Tagals. The trade, which is largely in British hands, has rapidly increased since the expiration of the privileges of the Royal Philippine Company in 1834. Manila hemp, sugar, coffee, and cigars are the chief exports, women being chiefly employed in making the last-named. Railways have only been opened in Luzon during recent years. During the Spanish-American War (1898) Manila was besieged and captured by the Americans.

Manila Hemp, the fibre obtained from the sheathing leaf-stalks of *Musa textilis*, a plant belonging to the same monocotyledonous genus as the banana and plantain, native to the Philippine Islands. It is almost exclusively cultivated in its native country, where the finer fibre is used in a raw state for shawls, etc. It is exported in increasing quantity from Manila and Cebu to England, the United States, and Australia, being the most valuable of cordage fibres and valuable also for paper-making.

Manin, DANIELE (1804-57), a Venetian patriot of Jewish descent, was born at Venice, where, after studying at Padua, he pursued his father's profession, that of an advocate. Many years before 1848 he became the chief leader of the anti-Austrian party, and on January 18 of that year was arrested and imprisoned. On the news of the revolutions in Paris and Tuscany he was released by the people, and on March 22 was appointed President of the republic. A year later, when Charles Albert was defeated, Manin was given unlimited powers in order to resist the Austrians; but on August 24 Venice was compelled to capitulate, and he was obliged to leave it for Paris, where for the rest of his life he taught Italian. In 1868 his remains were removed to Venice, where a statue was erected to him in 1875.

Manipur, or MUNIPUR, the name of a small state in the north-east of India, lying between

Assam and Upper Burma. The greater part of the population is concentrated in the Kuboo Valley. The country is ruled by a rajah, but a British agent resides at his capital, Manipur, or Imphail. On March 24, 1891, Mr. Quinton, the Chief Commissioner of Assam, Mr. Grimwood, the Resident at Manipur, and other British officers and civilians were treacherously assassinated by Tekenradgit Singh, whom they were about to depose. He was afterwards tried and executed, and a tribute was imposed upon the state.

Manipuri, a large semi-civilised nation on the north-west frontier of Upper Burma, who form the bulk of the population in the state of Manipur, and also the districts of Kachar and Sylhet farther north; have long been Hinduised in religion; but, although claiming Aryan descent, they appear to be a branch of the Kuki race, probably sprung from the old Kumal, Luang, Moirang, and Maithai tribes, who within comparatively recent times still inhabited the Manipur valley. They speak a language of Tibetan stock, which is cultivated and written with a peculiar alphabet based on the Devanagari.

Manitoba, a province of the Dominion of Canada, situated between Ontario, Saskatchewan, and Assiniboia, having the district of Keewatin as its eastern and the United States as its southern boundary. In area it is little smaller than the United Kingdom. The germ of the present colony was the Red River Settlement formed by Lord Selkirk in 1812. In 1868 the governmental rights of the Hudson's Bay Company were purchased, and two years later Manitoba was constituted into a province of Canada. In the same year Riel's rebellion was put down, and since that time the relations with the Federal Government have been comparatively smooth. The province is under a Lieutenant-Governor, with an Executive Council of five and a single elective Assembly of 40 members. It is represented in the Dominion Senate by four, and in the House of Commons by ten members. The winter in Manitoba is very severe, but the atmosphere is dry. The soil is very fertile, and the wheat grown on it is considered the finest in the western hemisphere. Dairy- and cattle-farming are also carried on with success; root crops are very prolific, and manufactures are growing. Some coal is found in the south, and the smaller fruits are indigenous. In the three great lakes, Winnipeg, Winnipegosis, and Manitoba, as well as in the rivers, there is an abundance of fish. The chief streams are the Red River, the Assiniboine, the Souris, and the Winnipeg. Except in the region of the Riding Mountains, between Lake Manitoba and the Assiniboine, the land is very level and comparatively treeless. The first railway was opened in 1879, and since 1885 Manitoba has had the benefit of the Canadian Pacific. Free grants of land are offered to suitable settlers by the Government, and there is still room for agricultural development. Large game is beginning to get scarce; but the chief wild animals and birds are protected by close times. [CANADA.]

Manitou, a term used by the North American Indians to denote a deity or spirit. Their religion is dualistic, and they recognise a Good and an Evil Spirit, with numerous lesser divinities. The name is also applied to the patron-animal of an individual.

Manna, an exudation from the stem of the so called "flowering" ash of southern Europe, *Fraxinus Ornus*, collected in the dry weather of July and August, in Sicily, from incisions in the stems of trees eight years old and upwards. A hectare ($2\frac{1}{2}$ acres) planted with 4,000 to 5,000 trees yields nearly 200 lbs. of manna. It contains 70 to 80 per cent. of *mannite*, $C_6H_8(OH)_6$, a sugar-like substance crystallising in rhombic prisms. Manna is used as a mild aperient for children. Somewhat similar substances are *oak manna*, produced on *Quercus Vallonia* and other oaks in Kurdistan, by the puncture of an insect; *Briançon manna*, on the leaves of the larch; *Alhagi manna*, from the leguminous *Alhagi camelorum* of Afghanistan, Beluchistan, and Persia; *tamarisk manna*; and *Australian manna*, from the leaves of *Eucalyptus viminalis*.

Mannheim, a town in Baden, is situated on the right bank of the Rhine just south of its junction with the Neckar. In 1606 a castle was built here by the Elector-Palatine, and the town was for many years the capital of the Palatinate. It suffered greatly during the Thirty Years' War, was destroyed by the French in 1689, and bombarded by the Austrians in 1795. It has now ceased to be a fortress, and has become instead a river-port and a manufacturing town. A fine palace was built here by the Elector-Palatine in 1720-29. The Schiller-platz contains a colossal statue of the great poet.

Mannheim Gold, an imitation gold alloy consisting of copper, zinc, and tin in the proportions 6, 2, and 1 respectively.

Manning, HENRY EDWARD, CARDINAL (1808-92), son of William Manning, M.P., was born in Hertfordshire. He took a first class both in classics and mathematics from Balliol College, Oxford, and was elected fellow of Merton. In 1834 he became rector of Lavington, Sussex, and in 1840 Archdeacon of Chichester. He had been a strong Tractarian at Oxford, and in 1851 (largely in consequence of the Gorham judgment) he seceded to the Roman Church, and published his *Grounds of Faith* in the next year. In 1865 he succeeded Wiseman as Archbishop of Westminster, and was named a cardinal ten years later. Supporting as he did the extreme claims of the Papacy, he was in much greater favour at Rome than Newman. In his later years he was prominent in social movements, such as the Dockers' strike in London in 1889, and in the temperance movement.

Manobos, an Indonesian people of the Philippine archipelago scattered in small groups over the island of Mindanao; are still mostly pagans living, not in tribes, but in little family circles often consisting only of the *bagani* (chief) and his

brothers with their wives and children. Some are agriculturists, growing maize, rice, and tobacco, while others are hunters and fishers, supplementing the produce of the chase with roots, reptiles, and fruits. The type differs greatly from that of the surrounding Malayan populations, and presents a striking resemblance to that of the Eastern Polynesians; hence the Manobos must be classed as Indonesians (q.v.). They are the most powerful and ferocious of all the Mindanao wild tribes, and the term Manobo is often applied by the Spanish writers in a general way to all the unreduced heathen populations of the Mindanao highlands. (Blumentritt; Montano, *Voyage aux Philippines*.)

Man-of-War Bird. [FRIGATE-BIRD.]

Manometer is an instrument used for measuring the pressure of a gas enclosed in a definite space. A simple form of the instrument consists of a box containing mercury; through the air-tight cover of the box passes a tube into the mercury, the upper end of the tube being open to the air. The vapour whose pressure is to be measured enters the box by another inlet, and if its pressure is greater than that of the air, mercury is forced up the tube, the height to which it rises indicating the pressure of the vapour. The change of form of a metallic tube, when filled with gases of different pressures, is the principle upon which *metallic* manometers work.

Manor, a district of ground held by great personages. The modern English manor derives its origin from subinfeudation, as it existed before the modifications of the system of tenures introduced by Magna Charta, and the still more important alterations made in the years 1290 and 1324, by which the granting land in fee simple, to be held by the grantee as tenant or vassal to the grantor, was in effect prohibited. A manor by reputation, however, but which has ceased to be a legal manor, may yet retain some of its privileges as a preserve for game, and the lord may still appoint a game-keeper thereto. [COPYHOLD, FEUDAL SYSTEM.]

Mans, LE, chief town of the department of Sarthe, France, stands on the left bank of the Sarthe river, 80 miles W. of Orleans. It is a historical city, the former capital of Maine, and the birthplace of Henry II., the Anglo-Angevin king. In modern times it has been the scene of a massacre of Vendéans in 1793 and of a great French defeat in 1871. Its cathedral is celebrated for its beautiful stained glass and fine 13th-century Gothic choir. In it is a monument to Berengaria, wife of Richard I. of England. There is a large poultry trade and candle manufacture.

Mansel, HENRY LONGUEVILLE (1820-71), Dean of St. Paul's, was born in Northamptonshire and educated at Merchant Taylors' and St. John's College, Oxford. He was successively Reader in Moral Philosophy, Waynflete Professor, Professor of Ecclesiastical History, and Canon of Christ Church at Oxford, and in 1869 became Dean of St. Paul's. His Bampton lectures, *The Limits of Religious Thought*, may be best remembered from

a famous protest by J. S. Mill (*On Hamilton*). In 1849 he had published an edition of Aldrich's *Logic*, which was long in use; and his chief metaphysical works were *Prolegomena Logica* (1851), and *The Philosophy of the Conditioned* (1866). He was also successful in light literature and parody, and had a brilliant reputation as a talker.

Mansfeld, PETER ERNEST, second count, was the natural son of COUNT PETER MANSFELD, the general of the Emperor Charles V. and governor of Luxemburg and afterwards of the Spanish Netherlands. Peter Ernest the younger, though legitimated by Rudolf II., was not given possession of his father's lands. He therefore left the imperial service, joined the Reformed Church, and became one of the leading Protestant generals in the Thirty Years' War, previous to which he helped the Duke of Savoy against Spain. Driven out of Bohemia, he for some time carried on guerilla warfare in the Palatinate, and defeated Tilly in 1622. Subsequently he took service with the Dutch, but in 1624 reappeared in Germany with an army which had been raised mainly in England. His career, however, being checked by the victory of Wallenstein at the bridge of Dessau (1626), he tried to join Bethlen Gabor, Prince of Transylvania, but was unable to obtain supplies to carry on the war. He died at Racowitza, in Bosnia, at the end of the same year.

Mansfield, WILLIAM MURRAY, EARL OF (1705-93), was a son of the fifth Viscount Stormont. He left Scotland in his fourteenth year for Westminster school, whence he was elected to Christ Church. In 1730 he was called to the bar, and first acquired a name by his defence of the city of Edinburgh in the matter of the Porteous riots. In 1742 he became Solicitor-General, and twelve years later first law officer and leader of the House of Commons; but in 1756, by accepting the Chief Justiceship he abandoned a purely political career. None the less he sat in every cabinet till 1783, and was the chief defender in the House of Lords of Lord North's Government. He was created Baron in 1756, and Earl in 1776, but twice refused the Chancellorship. As a judge Mansfield is regarded as the founder of commercial law. In 1788 he resigned the Chief Justiceship, and died five years later.

Manslaughter, a criminal offence, and defined as homicide felonious, but without premeditation, and it may be either (1) involuntary, as where a man, doing an *unlawful* act not amounting to felony, by accident kills another, or where by culpable neglect of duty he occasions another's death; or, (2) voluntary, as when, upon a sudden quarrel, two persons fight and one of them kills the other, or where a man greatly provokes another by some personal violence and the other immediately kills him. Both classes of the crime constitute felony, and are punishable, at the discretion of the court, by penal servitude for life or for not less than three years, or by ordinary imprisonment or by a fine.

Mantegna, ANDREA (1431-1506), a great Italian painter, was born in the neighbourhood of Padua, and adopted by Squarcione. At the age of seventeen he set up a studio on his own account, and studied classical models with great assiduity. He left Padua in 1459, leaving behind him many examples of his best work, and went to Verona, where he painted a Madonna in the church of St Zeno. He afterwards lived chiefly at Mantua, where the marquis was his patron. Mantegna's masterpiece, *The Triumph of Caesar*, is at Mantua; he was knighted by Gonzaga on its completion. Besides being celebrated for his great mastery of perspective and foreshortening, this painter will be remembered as having introduced into northern Italy the art of engraving on copper.

Mantell, GIDEON ALGERNON (1790-1852), the Sussex geologist, was born at Lewes. He practised as a surgeon at Lewes, Brighton, and Clapham, devoting his leisure to scientific work. He was awarded medals by the Geological and Royal Societies for his discovery and description of the Dinosaurian reptiles, iguanodon, hylæosaurus, Pelorosaurus, and Regnosaurus, and was the author of *Fossils of the South Downs* and *Wonders of Geology* (1833), a highly popular work. He was also an able lecturer.

Manteuffel, EDWIN HANS KARL VON, Field Marshal (1809-85), a great German general and diplomatist, was born at Dresden and brought up with his cousin Otto von Manteuffel, the statesman (q.v.). He entered the army in 1827, and in 1848 was one of the chief diplomatic as well as military advisers of Frederick William IV. of Prussia. In 1857 he became chief of the Military Cabinet, took part as lieutenant-general in the Danish campaign of 1864, and, as governor of Schleswig, drove the Austrians from Holstein in 1866. He next commanded with success the army of the Main, and at the end of the war with Austria went on a special mission to St. Petersburg. In October, 1870, he succeeded Steinmetz as commander of the First Army in the war with France, and after the victory of Amiens (November 27) occupied Rouen. Early in 1871 he was placed at the head of the Army of the South, and as such drove Bourbaki into Switzerland. He next commanded the Second Army Corps, and finally was for two years head of the Army of Occupation. In 1879 Field Marshal Manteuffel was named governor of Elsass-Lothringen.

Manteuffel, OTTO THEODOR VON (1802-82), a Prussian statesman, was cousin of the Field Marshal. After holding various important legal offices, he in 1847 became Prussian Minister of the Interior. He was the chief opponent of the revolutionists; but his name is chiefly remembered for his mistake in giving way to Austria at Olmütz in 1850, by which the transference of the German supremacy to Prussia was delayed for several years. His career closed eight years later, when Frederick William IV. became insane.

Mantua (Italian, *Mantova*), an ancient Italian city, is situated on a peninsula in the

Mincio, 25 miles south of Verona. It has an eventful history, having passed from Rome to the Ostrogoths, from them to the Lombards, becoming next a fief of the Empire under the Marquis of Canossa and the Duke of Lorraine. Matilda of Tuscany wrested it from the Empire, and after her death Mantua was an independent member of the Lombard League, till the Gonzagas attained power. In the 18th century the city again came under imperial power, and though captured by Napoleon in 1797 and restored in 1801 after its recapture, it remained Austrian till 1866. Mantua was the birthplace of Virgil and Mantegna, and contains noble memorials of the skill of Giulio Romano as architect and painter. It has also a fine library and an academy of arts and sciences. Its situation on a sluggish river, and amid swamps and stagnant pools, renders it very unhealthy, but makes it the strongest fortress in Italy.

Mantze, a Chinese term meaning "untameable worms," applied in a general way, in the sense of "barbarous" or "wild," to the hill tribes especially of the southern and south-western provinces. In 1877 Lieutenant Gill visited the Sumu, a large nation called by the Chinese "White Man-tze," who formed a confederacy of 18 groups recognising a king or lord paramount, and reaching from west Yunnan to the extreme north of Secluen. They wore the Chinese dress and conformed to Chinese customs, but spoke a language "resembling Sanskrit" (?). These are in no sense "wild;" for they carefully till the land, weave textiles, build houses and towers in the Tibetan style, have schools for their children, and even possess books in Tibetan and Chinese characters.

Manu ("Thinking Being"), the traditional author of the great sacred book of the ancient Hindus and of an ancient work on Vedic rites. In Hindu mythology there are a succession of Manus, each of whom created the world anew. The law book contains the whole duty of man in all his relations in 12 books. The date of its compilation is now placed between the 2nd century B.C. and the 2nd century of the Christian era. The first English translation was made by Sir William Jones.

Manual. [BREVIARY.]

Manucode, any bird of the genus *Manucodia*, from the Papuan sub-region, classed with the Birds of Paradise (q.v.), though some authorities place them with the crows. The plumage is a glossy steel-blue, and there are no accessory plumes.

Manx, the natives of the Isle of Man, who are Celts of the Gadhælic (Irish) branch, with a large infusion of Norse blood. The Manx language is a pure Gadhælic dialect, apparently more allied to the Erse than to Irish. Till about the year 1600 it was spoken exclusively, but since then English has made steady progress, and it is now but little spoken. At present it is mainly confined to the Bride, Gurby, and Arbory districts. Church service in the Manx language has been discontinued since the middle of the 19th century. The literature consists mainly of some religious treatises and a few ballads, dating from the 16th century. A dictionary was compiled in 1835.

Manzoni, ALESSANDRO, CONTE DI (1785-1873), a great Italian writer, was a native of Milan and a grandson of Beccaria. He was educated at Pavia, and spent some years at Paris before his marriage. After losing the greater part of his property, he returned to Milan. His literary career was short, but fruitful. It began with the publication of some hymns of great beauty. *Il Conte di Carmagnola*, a tragedy published in 1819, was attacked by the *Quarterly Review*, but defended by Goethe. It was followed by *Adelchi*; by *Il Cinque Maggio*, an ode on the death of Napoleon I.; and, above all, by the romance *I Promessi Sposi* (1827). Manzoni also wrote *Observations on Catholic Morality*, translated into English as *A Vindication of Catholic Morality*. In 1860 the great writer was named a senator of Italy, and helped to draw up a scheme for the merging of dialects in a national language.

Maori (i.e. "native," "indigenous"), the aborigines of New Zealand, who are the southernmost group of the Eastern Polynesians, apparently most nearly related to the Rarotonga islanders, but evidently with a strain of black blood derived perhaps from a Melanesian element existing in the archipelago before their arrival some 600 or 700 years ago. At the time of the discovery (1769) they were estimated at from 300,000 to 500,000, mostly concentrated in the North Island, for in the South Island they were never very numerous. Since contact with Europeans, the Maori, like all other Polynesians, have continued steadily to decline, falling in 1840 to 115,000, in 1857 to 56,500, and in 1908 to 49,000 including half-breeds. These are now mainly confined to the King Country in the North Island, which may be regarded as a sort of reservation, some 10,000 square miles in extent, secured to the natives by treaty rights. If not the finest, the Maori are certainly the most vigorous and energetic, of all the South Sea islanders, with strong, muscular frames, regular features formerly disfigured by elaborate tattoo markings, black, crispy hair, olive brown complexion. They are naturally intelligent, with some knowledge of medicine and even of astronomy, good musicians, skilful carvers in wood, great orators, brave and warlike, although since their final reduction by the English in 1869 they have never ventured to renew the struggle for independence. Their literature, purely oral, is rich in poetry, national songs, folk-lore, legends, and traditions, and much of these materials has been committed to writing by European students. The Maori were formerly polytheists, worshipping many deities besides the *atua* or Supreme Being; yet there were neither temples nor idols, nor a cult in the proper sense, the so-called *tohunga* or "priests" being rather soothsayers and wizards, charged also with the preservation of the national myths, songs, and legends. The people were undoubted cannibals, but nearly the whole nation is now Christian, evangelised by Protestant missionaries, whose first station was founded in 1814 in the North Island. They have a special franchise, and elect four members to the House of Representatives.

Map, or MAPES, WALTER, the creator of the Arthurian legend in its modern form, was perhaps

a native of Herefordshire. After studying at the university of Paris, he rose rapidly at the Court of Henry II., was a justice itinerant in 1173, and became Archdeacon of Oxford in 1196. He appears to have been equally in favour with Richard I. and John, but when he died we do not know. Map wrote in French the *Quest du Saint Graal*, and probably also the *Saint Graal*, and great part of *Lancelot du Lac*. In Latin he wrote an anecdotal work, *De Anecdotis Curialium*, and the satirical poems, *Goliath Episcopus* and the rest, have often been ascribed to him. He was the friend of Becket and Giraldus Cambrensis.

Maple, the English name for the trees of the genus *Acer*, which gives its name to the sub-order *Acerineæ* of the order *Sapindaceæ*. It includes about 50 living species, natives of the Northern



MAPLE (*Acer campestre*).

Hemisphere, and 19 species have been described as occurring fossil in the Miocene rocks of Oeningen. The maples are trees or shrubs with opposite, palmately-lobed leaves; inconspicuous flowers in polygamous clusters; and double or two-winged samaræ (q.v.) as fruits. The leaves of both fossil and recent maples are commonly blotched with black spots caused by a fungus, *Rhytisma*. The wings of the samara vary much in size and in shape, being oblong in the common maple and more rounded and less divergent in others. They are rotated by the wind as the fruit falls, like a screw-propeller, and thus disperse the seed to some little distance from the parent tree. *A. campestre*, the only British species, often only a hedgerow shrub, affords excellent charcoal and a wood susceptible of high polish and sometimes beautifully mottled, which was formerly used for *mazer-bowls*. *A. pseudo-Platanus*, the sycamore, a handsome European tree much grown in Britain since the 16th century, and the allied *A. platanoides*, the Norway maple, introduced at the end of the 17th century, have fine-grained, white wood, largely used in turnery. *A. saccharinum*, the sugar or rock maple, and *A. rubrum*, the scarlet maple, natives of North America, yield a sap, from which *maple sugar* is still extensively prepared in the north-eastern United States and Canada. The wood of the latter, in old trees, has a wavy grain known as *curled maple*, and that of the former varies, producing both *blister* and *bird's-eye maple*, which are much

prized for inlaying. *A. palmatum* and several other Japanese species are in cultivation, which, like *A. rubrum* and our own maple, are remarkable for the autumn tints of their foliage. Those American and Japanese trees, which differ in having pinnate leaves, are now separated as the genus *Negundo*. A variegated form of *N. fraxinifolium* is a favourite tree in gardens.

Marabou. [ADJUTANT.]

Marabouts, a race of Mohammedan priests or saints in North Africa, who carried on the traditions of the Morabits (q.v.).

Maracaibo, a town in Venezuela, stands on the west side of the entrance of Lake Maracaibo. The town has a fine appearance, and is fortified, but is unhealthy. A great deal of coffee is exported. The exports chiefly go to the United States, but Great Britain has a large share in the imports. The Gulf of Venezuela, separated by a narrow strait from Lake Maracaibo, is sometimes known as the Gulf of Maracaibo.

Maranhão, or MARANHÃO, the name of a maritime province and its capital in Brazil. The latter is situated on an island, and has a cathedral and bishop's palace built by the Jesuits. Cotton and sugar are exported, and manufactured goods taken in return, chiefly from Great Britain. Lord Cochrane, who captured the place in 1823, received the title of Marquis of Maranhão.

Maraschino, a liqueur obtained by the distillation of a fine growth of cherry (*Marasca*) obtained chiefly in the neighbourhood of Zara in Dalmatia.

Marat, JEAN PAUL (1742-93), was born near Neuchâtel. Marat took very little interest in politics until the eve of the Revolution, but like his father followed the profession of medicine. He had, however, very early read and admired Rousseau. He came to England probably about 1770, and lived there some 10 years. He practised some time as a fashionable doctor while living in Church Street, Soho, and was in 1775 created M.D. of St. Andrews. The unorthodoxy of his scientific views prevented the Académie des Sciences from admitting him to membership, and from March, 1789, when he published his *Offrande à la Patrie*, Marat was a politician only. Later in the same year he wrote a pamphlet against the English Constitution, and in September his journal, *L'Ami du Peuple*, began to appear, and soon exercised a considerable influence. Lafayette endeavoured to suppress it in the following year, and Marat had to flee the country, and even when he came back to pass many days in the sewers of Paris. He had no party or even personal friends in the Convention, to which he was elected by Paris, but was supported by the mob. He was largely responsible for the September massacres, and the last year of his life was a successful struggle with the Girondins, whose war policy he had denounced. He was sent before the Revolutionary Tribunal and tried on April 22, 1793, but acquitted, and the Girondins never recovered their defeat. On July 13th he was assassinated by Charlotte Corday (q.v.).

Marathon, perhaps identical with the modern Marathon, was a small town in a plain to the north-east of Athens, between the mountains and the sea. In history it is famous as the scene of the victory of Miltiades over the Persians in 490 B.C.; in mythology as the scene of the earliest worship of Apollo, and of several incidents in the Heracleian and Theseid legends.

Maravars, an outcast people, South India, in Madura and from Ramnad to Cape Comorin; are of extremely dark complexion, and although now speaking a Tamil (Dravidian) dialect, are not Dravidians, but survivors of the aboriginal Negrito population of India. (E. Callamand, *Tribes des Maravas*, in *Revue d'Anthropologie*, 1878.)

Maravi, a historic people of South Africa, who formerly held a dominant position in the region south-west of Lake Nyassa. They are mentioned in the missionary reports of the 17th century, and they figure on D'Anville's map, and the great *Lake Maravi* known at that time by hearsay, and since identified with Livingstone's Lake Nyassa, was named from them. Later they were driven from most of their territory by the Maviti, Angoni, and other Zulu invaders, and in 1863 Livingstone found them confined to the Deza plateau, near the south end of Nyassa. Since then they have almost disappeared altogether, although in 1884 Consul O'Neill heard of a broken Maravi tribe in the Mihawani district, south-east of the Namuli highlands. They appear to be a Bantu people belonging to the same stock as the present Manganjas. (Livingstone, *Last Journal*.)

Marble is a term strictly applied to any limestone susceptible of polish, though often inaccurately extended to alabaster, serpentinite or granite. Marbles are generally partly or completely crystalline in texture, the latter—such as the white marble of Carrara—being known as *saccharoid*. The beauty of many varieties depends upon the presence of fossils in them, as in the *madrepore* marbles with fossil corals in the Devonian rocks, the *encrinital* and *bird's-eye* marbles of the Carboniferous rocks of Bristol and Derbyshire and the fresh-water *Paludina* marbles of Purbeck and Sussex made up of the snail-shells now known as *Viviparus*. The more completely crystalline marbles owe their texture to metamorphic action, known technically as *marmarosis*. This may be due to the heat from contact with igneous rocks or pressure. The white statuary marble of Carrara, in Tuscany, used by Michelangelo and Canova, and imported as "Sicilian" marble, is that employed by modern sculptors. Its age is variously stated as Carboniferous, Triassic and Liassic. From the same source comes the grey-veined marble, known in Italy as *hardiglio*. Somewhat similar are the marbles of Mount Pentelicus, in Attica, used by Phidias and Praxiteles in the Parthenon, as seen in the Elgin marbles in the British Museum; and of the island of Paros, represented by the Venus de' Medici. *Black marble* is obtained from Carboniferous rocks at Ashford, Derbyshire, and various places in Ireland.

It contains bituminous matter and is, therefore, known mineralogically as *anthracomite*. True red marble is uncommon, some of the rocks so called being porphyritic felsites. Green marbles such as *verd antique*, *Irish green* marble from Connemara, and *Mona marble* from Anglesey, are *ophicalcites*, or mixtures of serpentine and limestone of metamorphic origin. *Landscape* or *Cotham* marble, from the White Lias of the Rhætic series near Bristol, is a dull grey clayey limestone, with tree-like markings produced by infiltrated oxide of manganese. Algerian and Mexican onyx or *onyx-marble* is a translucent brownish and yellowish stalagmite (q.v.) formed by the evaporation of carbonated water, the alabaster of the ancients being a similar stone.

Marburg, a town in Hesse-Cassel, situated on the left bank of the Lahn, about midway between Cassel and Coblenz. Here St. Elizabeth of Hungary, wife of the landgrave of Thuringia, died in 1231, and in the 15th and 16th centuries it was generally the capital of the landgraves of Hesse. Here also Luther and Zwingli conferred in 1529, in the hall of the great Schloss or Castle, which was even then more than 300 years old. Two years before Marburg University had been founded by the Protestant Landgrave Philip. The city is distinguished architecturally by a fine specimen of early Gothic, the Elisabethenkirche, built by the Teutonic Order to contain the tomb of St. Elizabeth. It is also celebrated for its pottery.

Marcantonio Raimondi, the great Italian engraver, who is usually known only by his Christian name, was born towards the close of the 15th century at Bologna. Here until 1510 he chiefly lived as a goldsmith and engraver in the workshop of Francia. From this time till it was taken by the Spaniards in 1527 he lived at Rome, and engraved many of the best pictures of Raphael and Giulio Romano. It is probable that he died at Bologna a few years later. Besides his designs after Raphael, Marcantonio engraved a portion of the design of Michelangelo's *Battle of Anghiari*, and executed engravings in copper from Dürer's *Life of the Virgin* and *Little Passion*.

Marcasite was formerly used to denote any mineral which possessed a high lustre and metallic appearance, especially those now called pyrites. Bismuth was also known under the name of marcasite. It is now confined to a mineral sulphide of iron of the same composition as iron pyrites, FeS₂, from which, however, it differs in forming crystals belonging to the rhombic system, iron pyrites crystallising in cubes.

Marceau, FRANÇOIS DESGRAVIERS (1769-96), a young French general of great promise, was a native of Chartres. In 1792 he distinguished himself in the defence of Verdun. He next served with distinction in La Vendée. At the victory of Fleurus he commanded the right wing of the republican army. He was killed at Altenkirchen in September, 1796, when in command of the first division of the army of the Rhine.

Marcellus, MARCUS CLAUDIUS, a Roman general who was five times consul. In 222 B.C. he

won for the last time the *Spolia opima* by killing with his own hand Viridomarus, King of the Insubrian Gauls. His next exploit was the saving of Nola from Hannibal after Cannæ. During the second Punic War he also reduced Syracuse by blockade and conquered Sicily. During his last consulship he was killed in a skirmish with Hannibal near Venusia (208 B.C.), at which place he had fought an indecisive battle in the preceding year.

Marcellus II., Pope of Rome, as Cardinal Cervini presided over the Council of Trent. He was elected to the Papacy in April, 1555, but died three weeks later. He was the only Pope who retained his Christian name in his Papal title. To him is dedicated Palestrina's famous Mass.

Marcet, JANE (1769-1858), the author of *Conversations on Chemistry*, *Conversations in Political Economy*, and similar popular manuals published at the beginning of the 19th century, was born at Geneva, and married a doctor there, with whom she came and lived in London. She wrote also *Stories for Very Little Children*.

March, the first month of the ancient Roman year, *Martius (mensis)*, sacred to Mars, god of war, and the third month of the later Roman (Julian) and English year. In this month the sun leaves the sign of Pisces and enters that of Aries.

Marcion, founder of a sect of Christian ascetics, in the 2nd century, was a shipowner at Sinope. About the year 139 he came to Rome, and, being unable to find acceptance for his peculiar doctrines, headed a schism five years later. When he died, some 20 years after, numerous branches of the sect had been formed in all parts of the Roman Empire, and for five centuries the leading fathers of the Church wrote much in refutation of its doctrines. The main feature of these was the interpretation of Pauline doctrine as conveying the existence of two gods, the god of the Old Testament, who represented stern justice, and that of the New, redemption and mercy.

Marconi, GUGLIELMO, electrical engineer, was born in 1875, his mother being an Englishwoman. He was educated at Leghorn and Bologna, at which latter place he invented his system of wireless telegraphy (q.v.). In 1896, in conjunction with Prof. Preece, he made experiments with satisfactory results, and since then he has greatly improved his apparatus. In 1901 he succeeded in communicating across the Atlantic, and in 1907 began a public service of wireless telegraphy across that ocean. [WIRELESS TELEGRAPHY.]

Maremma (corruption of *Maritima*), a marshy region of Tuscany, extending along the coast from the river Cecina southwards. It was once fertile and populous, but is now haunted by malaria, though crops are now and again being grown and pasture is good.

Marengo, a village three miles S.E. of Alessandria in eastern Piedmont, which was the scene of a great battle on June 14, 1800, between Bonaparte and the Austrians.

Mareotis, LAKE, now called EL MARIÛT, a brackish lake in northern Egypt, separated from

the Mediterranean by a narrow strip of land, on which part of Alexandria is situated. It is 40 miles long and 18 broad. It was once navigable, but has frequently so far dried up as to be no more than a marsh, as in 1882.

Margaret, Queen of Denmark, Norway, and Sweden, was born in 1353, and in 1375 was chosen as successor to her father, Waldemar IV., on the Danish throne. On the death of her husband, Hacon VIII., she also became sole ruler of Norway, and in consequence of an invitation from the Swedish nobles she invaded their country and wrested the crown from Albert of Mecklenburg. In 1396 Eric of Pomerania, Margaret's grand-nephew, became titular king of the three countries, the Union of Colmar in the following year making Scandinavia one kingdom. Margaret, however, really directed affairs till the last, and added Lapland and Finland to her dominions.

Margaret, Queen of Scotland, was born about 1050 in Hungary, and educated under Lanfranc at the Court of Edward the Confessor. Two years after the Norman Conquest she took refuge in Scotland, and was married by Malcolm Canmore in 1069. The young queen was a great civilising influence. She died in 1093, and was canonised in 1250.

Margaret of Anjou, Queen of England, daughter of René of Anjou, titular king of Naples and Jerusalem, was born in a town in Lorraine in 1429. In 1445 she was married to Henry VI. of England; Anjou and Maine were to be ceded to René. Margaret, supported by Suffolk and Somerset, came into violent conflict, first with the Duke of Gloucester, and afterwards with Richard, Duke of York. After the death of Somerset at St. Albans she became herself the strongest force on the Lancastrian side, and in 1460 she succeeded in defeating York at Wakefield and the Earl of Warwick at the second battle of St. Albans. The defeat of Towton, however, obliged her to flee to Scotland and, after the disasters which succeeded it, she retired to Lorraine for six years. In 1470 it was agreed that Warwick's daughter should marry her son, but Barnet and Tewkesbury destroyed their hopes. Margaret was ransomed from prison by the French king, and died in France in 1482.

Margaret of Navarre (MARGUERITE D'ANGOULÊME), sister of Francis I. of France, was born in 1492. She was married, first to Charles, Duc d'Alençon, in 1509; secondly, in 1527, to Henri d'Albret, King of Navarre. By the latter she had a daughter, Jeanne d'Albret, who became mother of Henri IV. She was the author of some interesting letters, of some poems, *Les Marguerites de la Marguerite*, and the *Heptameron* is usually attributed to her. She died in 1549.

Margaret of Valois ("LA REINE MARGOT"), great-niece of Margaret of Navarre and daughter of Henri II. and Catharine de Medici, was born in 1553. She was married to Henri of Navarre (Henri IV.) on the eve of St. Bartholomew, and soon became celebrated for her beauty and

licentiousness. On the accession of her husband to the throne of France he divorced her, but afterwards frequently consulted her. Marguerite de Valois died in 1615, leaving behind her some well-written memoirs.

Margaric Acid is an organic fatty acid of the composition $C_{17}H_{34}O_2$. It forms a white crystalline mass, which melts at about $60^{\circ}C$, and in its properties closely resembles palmitic acid. It forms salts termed *margarates*. It is doubtful whether it really occurs in the natural fats, though it is usually stated to be a constituent of *margarine* (q.v.).

Margarine, a solid mass which can be obtained from a large number of oils and fats, e.g. olive oil, goose grease, lard, butter, etc. It may be crystallised, and so forms colourless needles melting at $49^{\circ}C$. Chemically it consists, like all fats, of a compound of glycerine with one or more organic acids, probably chiefly palmitic and stearic.

Margate, an English watering-place, in the Isle of Thanet district, on the North Foreland, 66 miles east of London. It has two fine churches, a deaf-and-dumb asylum, and a sea-bathing infirmary, and is much resorted to by Londoners. The pier is 300 yards long, and there is a jetty of still greater length. Margate is a corporate town. Pop. (1901), 23,057.

Maria Christina. [CHRISTINA MARIA.]

Maria Louisa, Empress of France, was the daughter of Francis I. of Austria. She was born in 1791, and in 1810, after Wagram, was given in marriage to Napoleon. Next year she bore a son, who was called King of Rome. During her husband's absence with the army she was Regent of France. On the abdication of Napoleon in 1814 she retired to Vienna, and contracted a morganatic marriage with Count Neipperg, by whom she had three children. In 1816 she was put in possession of the duchies of Parma and Placentia, and Guastalla, but was driven out by a rising in 1831. She was subsequently restored by the Austrians, but died at Vienna in 1847. The king of Rome (or Napoleon II.) died in 1832.

Mariana, JUAN DA (1536-1624), the Spanish historian, was born of humble parents at Talavera de la Reina. He entered the Society of Jesus at an early age, and afterwards taught at Jesuit colleges in Rome, Sicily, and Paris. In 1574 ill-health compelled his retirement to Toledo, where he gave his remaining years to literary and historical writing. His two great works were his *Historiæ de Rebus Hispaniæ*, which he himself translated into Spanish, in which the history of Spain to the year 1621 was contained; and the treatise *De Rege et Regis Institutione* (1599), in which was maintained the lawfulness of deposing kings. The latter was condemned by the General of the Jesuits, and Mariana's *Seven Theological and Political Tractates* (1609) were placed upon the Index Expurgatorius, the author also being imprisoned by the Inquisition.

Maria Theresa, Queen of Hungary and Bohemia and Empress of Germany, daughter of the

Emperor Charles VI., was born in 1717. In 1736 she was married to Francis of Lorraine, who a year later became Grand Duke of Tuscany. In 1724, on the death of her brother, Charles VI. declared her heir to his hereditary dominions, and he spent the last few years of his life in unceasing efforts to secure her peaceful succession by obtaining guarantees of the Pragmatic Sanction from the different Powers. Notwithstanding, when he died, in 1740, Frederick the Great invaded Silesia, Charles Albert of Bavaria contested the will of the late emperor, while Saxony and Spain also advanced claims, and France supported Bavaria in return for a free hand in the Netherlands. Maria Theresa rose to the occasion, and obtained the support of the Hungarians by granting them constitutional privileges and the right of carrying arms. The secret convention of Klein-Schnellendorf was made (October, 1741) with Prussia by English mediation, by which Lower Silesia was ceded. Less than two months later, however, it was shamelessly broken by Frederick, and next month the Elector of Bavaria was elected emperor instead of Maria Theresa's husband. She, however, succeeded in preserving all her territory with the exception of Silesia, the whole of which was ceded to Prussia at the peace; and after the death of Charles Albert (1745) the Grand Duke Francis was elected his successor in the empire, with the title of Francis I. The next few years saw the rise of Kaunitz (q.v.), and a complete revolution in European politics. In the Seven Years' War, though Frederick began hostilities, he was forced to do so on account of the schemes of revenge which he knew that Maria Theresa (this time with France, Russia, and Saxony as her allies) was forming against him. After nearly seven years of terrible battles, Austria was obliged to make peace in 1763 without having regained the territory lost in the last war. Two years later Maria Theresa's son Joseph was elected to the empire in succession to his father; and from this time till her death in 1780 he shared the rule of the Austrian territories with her. Almost to the last she kept control of home affairs. [AUSTRIA, FREDERICK II., JOSEPH II., KAUNITZ.]

Marie Antoinette, JOSEPHE JEANNE, Queen of France, was the fourth daughter of Maria Theresa and the Emperor Francis I. She was born in 1755, and in 1770 was married to Louis, Dauphin of France, who became Louis XVI. four years later. Marie Antoinette was expected to watch over Austrian interests in France, and was carefully tutored by Maria Theresa on that subject, and also on her own conduct. On account of her position in this respect, and of the heedlessness of her life, she had become very unpopular before the Revolution. Though guiltless in the affair of the diamond necklace [ROHAN, CARDINAL DE], the belief in her guilt was widespread, and the company she kept made all appearances tell against the purity of her life. In home politics she procured the dismissal of Turgot, and, though she tried to keep Necker in office in 1781, her friends thwarted his most important measures. The birth

of her children raised up bitter enemies to her in Orleans and his party, who did all they could to ruin her in public opinion. Marie Antoinette induced Louis to take the fatal steps of the attempted *coup d'état*, which led to the taking of the Bastille, and the still more fatal flight to Varennes. By her, too, he was prevented from giving full confidence to either Mirabeau, or Lafayette, or to the moderate Jacobins. Marie Antoinette was imprisoned with her family in the Temple after the proclamation of the republic in August, 1792, but she was afterwards separated from her children and sent to the Conciergerie. In October, 1793, several months after the death of her husband, she was brought before the revolutionary tribunal, and was guillotined on the 16th in the flower of her life. [LOUIS XVI., MIRABEAU, ETC.]

Marie de France, a writer of poetry in a Norman-French dialect, is supposed to have lived in England at the beginning of the 13th century. Her works first consist of fourteen *Lais*, or narrative poems, in octosyllabic metre; secondly, of 103 fables (*The Ysopet*), which were translated from Latin into English by Henry III., and thence into French by Marie herself, "for the love of Count William, the most valiant of this realm," who has been identified with William Longsword of Salisbury; thirdly, of a poem of over 2,000 lines descriptive of the purgatory of St. Patrick.

Marie de' Medici, second wife of Henri IV. and daughter of Francis I. of Tuscany, was born in 1573 and married in 1600. Next year she gave birth to a dauphin, afterwards Louis XIII., but not long after separated from her husband. From 1610 to 1617 she was regent for her son, but in the latter year was deposed, the influence of Concini, Marquis d'Ancre, with her having excited universal displeasure. After an absence of two years she reappeared at Court, and soon began to intrigue against Richelieu, but her devices having been discovered, she was imprisoned at Compiègne. She escaped to Brussels in 1631, and died at Cologne in 1642. The Luxemburg Palace was built by her.

Marienbad, a watering-place in the north-west of Bohemia, about 18 miles south of Carlsbad. The salt springs, which are cold and aperient, were used by no one not living in the locality until the first decade of the 19th century. They belong to the neighbouring abbey of Tepl. The place is now much resorted to both for external and internal treatment, and many bottles of the water are exported. There is a theatre here, and an English church.

Marienburg, a Prussian town 30 miles S.E. of Dantzic, stands on the Nogat, an affluent of the Vistula. The Teutonic Knights built a castle here in 1274, and from 1309 till 1457, when it fell into the hands of the Poles, it was their headquarters. Frederick the Great added it to Prussia by the first partition. The Marienburger Schloss, which was restored in the first half of the 19th century, is one of the most interesting Gothic buildings in Europe.

Mariette, AUGUSTE FERDINAND FRANÇOIS (1821-81), called MARIETTE PASHA, was born at Boulogne, and educated there and at Douai. After

a short time spent in England, he became professor at Boulogne Municipal College, and through having been entrusted with the papers of his cousin, Nestor l'Hôte, he began to study Egyptology. In 1849 he was given an appointment in the *musée* at the Louvre. In the following year he was sent to Egypt by the Government to discover Coptic MSS., and spent the rest of his life there, with the exception of the years 1854 to 1857, when he published the results of his recent discoveries. On his return he was made inspector-general of Egyptian monuments. In 1863 he became director of the museum at Boulak (now Gizeh), and next year published *Aperçu de l'Histoire d'Égypte*. Further results of his excavations in the Nile valley were *Abydos* (1869-80), *Karnak* (1875). In 1878 he became a member of the Institut, and he died at Cairo in 1881.

Marigold, the popular name of several plants with golden blossoms, especially *Calendula officinalis*, the garden marigold, *Chrysanthemum segetum*, the corn marigold; the various species of *Tagetes*; the so-called French and African marigolds; and



MARIGOLD (*Calendula officinalis*).

Caltha palustris, the so-called marsh marigold. All these, except the last, which is ranunculaceous, belong to the order Compositæ (q.v.). The *Calendula* is a native of south Europe, and the *Tagetes* of Mexico and Peru. The corn-marigold is a common weed in our corn-fields, and the marsh-marigold grows in bogs and by the side of ditches. The *Calendula* was the *goldes* of Chaucer, the *heliotrope* of some old writers, "the marigold that goes to bed with the sun, and with him rises weeping" of Shakespeare's *Winter's Tale*.

Marine Corps, ROYAL, a military force under the Lords Commissioners of the Admiralty, available for service either on sea or on land. The Marines were, in the 17th century, ordinary land soldiers detailed for service on board ship; but long before the close of that century they began to be specially raised, and they were then known as the Lord High Admiral's Maritime Regiment of Foot, or, briefly, as the Admiral's Regiment. In 1684 the corps included twelve companies. After 1684 several other maritime regiments, such as those of Colonel Colt, Sir Cloudesley Shovel, and Lord Torrington, were raised and again disbanded; and it was not

until the dawn of the 18th century that this most valuable force, the proud motto of which is "*Per Mare, Per Terram*," began to assume the character which has ever since been associated with it. The corps is now divided into artillery (blue uniform) and light infantry (red uniform), and the headquarters of the former are at Portsmouth, while those of the three divisions of the latter are at Chatham, Plymouth, and Portsmouth respectively.

Marine Engines, engines used in steamers which make sea voyages.

Marine Glue, a solution of one part india-rubber, gently heated in mineral naphtha or coal-tar twelve parts, with the addition of powdered shellac twenty parts. Having been made, it is poured upon a slab to cool, and when needed for use is heated to about 250° Fahr. It is very adhesive, and unaffected by moisture. Another glue to resist moisture is composed of ordinary glue 1 lb. melted in skimmed milk two quarts, or of ordinary glue mixed with common chalk. A glue cement to resist moisture is made of glue 1 lb., black resin 1 lb., red ochre $\frac{1}{4}$ lb., mixed with the least quantity of water.

Mario, GIUSEPPE, MARCHESE DI CANDIA (1808-83), the great tenor, was, according to Engel, born at Cagliari. After serving for some time in the army of Piedmont, he came to Paris, where in November, 1838, he made his first appearance as a singer in *Robert le Diable*. His fine voice and pleasing manners soon made him highly popular in Paris, London (where he made his *début* in 1839), and St. Petersburg. He sang chiefly in the operas of Donizetti, Rossini, Meyerbeer, and Verdi. In 1846, under the conductorship of Costa, he and Grisi formed the centre of the new Royal Italian Opera in London, where he made his last appearance in July, 1871. He lost a large fortune by unfortunate speculations. He formed a connection with Giulia Grisi, by whom he had several daughters.

Marionettes, puppets moved by strings, which on a small stage imitate the actions of theatrical performers. Such puppets were exhibited in England in the latter half of the 17th century, and the "marionette theatre" is one of the most popular amusements in Italy.

Mariotte, EDMÉ, a French physicist of the 17th century, was born in Burgundy, where he was prior of St. Martin-sous-Beaune. He was one of the earliest members of the Académie des Sciences, and died at Paris in 1684. His most important work is *Essais de Physique*, containing the statement of the law of the pressure and volume of gases, which was called "Mariotte's law," though discovered by Boyle. Collections of his works were published at Leyden in 1717, and at the Hague in 1740.

Marius, CAIUS (155-86 B.C.), a great Roman general, was born at Arpinum. He entered the army as a common soldier, and rose to be an officer in Spain under Scipio Africanus the Younger. His marriage with Julia, the aunt of Julius Cæsar, assisted his advancement, and in 115 B.C. he became prætor. As second in command under Quintus Metellus he distinguished himself in the Jugurthine

War, and in 107 was elected consul and entrusted with the conclusion of the war, which he successfully accomplished. Marius was now employed to repel the incursions of the Cimbri and Teutones, and for this purpose was made consul in 104 and the three successive years. During this time he seems to have completely reorganised the Roman army. [LEGION.] The Teutones were overthrown with great slaughter in a terrible two days' battle near Aquæ Sextiæ (Aix) in 102 B.C., and the Cimbri were routed at Vercellæ, between Turin and Milan, in the following year. The remainder of the life of the great general was passed in a bitter struggle for political power with Sulla, the representative of the aristocratic party. Marius was made consul for the sixth time in 100, but was worsted by his rival in the contest for the command against Mithradates, and in 88 had to flee from Rome. The story of his attempted assassination in the marshes near Minturnæ (the modern Garigliano) is well known. He succeeded at length in escaping to Africa; and, a revolution in Rome having given his party the ascendancy, he returned to be elected consul a seventh time (86 B.C.), and to wreak vengeance on his opponents by a terrible proscription. He died seventeen days later.

Marivaux, PIERRE CARLET DE CHAMBLAIN DE (1688-1763), an ingenious French writer, the son of a financier, was born at Paris. Between 1713 and 1715 he wrote novels, but he first attracted attention by his burlesques of Homer and of Fénelon. He then produced at the Italian theatre a good number of clever plays, the best of which were *Le Jeu de l'Amour et du Hasard* (1730), and *Les Faussettes Confidences* (1737). He also wrote a great deal for periodicals, and in 1731 began his chief work, the novel *Marianne*. His literary affectations gave the name of "Marivaudage" to writings of a similar style.

Marjoram, the English name of several species of *Origanum*, a genus of herbs and undershrubs belonging to the order Labiata (q.v.). They have bracts as long as the calyx and of the same colour, from 10 to 13 ribs in the tubular calyx, and an almost polysymmetric corolla. Wild Marjoram (*O. vulgare*) is common on limestone, growing a foot or two in height with massed pinkish flowers with deep crimson bracts and calices, and a somewhat stiffly dichotomous branching. It yields an acrid stimulant oil, known as *oil of thyme*, used in farriery and dentistry. *O. Marjorana* and *O. Onites*, natives of southern Europe, are old-fashioned pot-herbs.

Mark, the traditional author of the 2nd Gospel. The name occurs in the Acts of the Apostles (xii. 12) as "John, whose surname was Mark," to whose mother's house Peter went when released from prison. John Mark accompanied Paul and Barnabas on their first missionary journey, but left them at Perga, and returned to Jerusalem (Acts xii. 25; xiii. 13). Mark afterwards sailed with Barnabas to Cyprus (*ib.* xv. 38). St. Paul appears to have been afterwards reconciled to him, according to passages in Colossians, Philemon, and second Epistle to Timothy. In 1 Peter v. 13 "Mark, my son," is

spoken of; this has been taken literally by some, metaphorically by other authorities. Whether the Pauline, the Petrine, and the Synoptic author were identical has been much disputed. [GOSPELS.]

Mark, GOSPEL OF ST., the second of the Canonical and Synoptical Gospels of the New Testament, attributed by the Fathers to John surnamed Mark, a friend and follower of St. Peter. This Gospel was composed probably at Rome after 63 A.D. There is internal evidence that it was addressed to Gentiles, and was influenced by the testimony and teaching of St. Peter. The "received text" is mainly based on the edition of Erasmus (1516). The narrative of St. Mark is in many points more vivid and minute than those of the other Gospels.

Mark Antony. [ANTONY.]

Marl, an earthy rock containing lime mixed with clay or sand or both. One of the commonest forms of it is the *shell-marl* of fresh-water lakes, which consists of the remains of mollusks, entomostracans, and algæ, and is generally white. It accumulates in lakes, where there is little mechanical sediment, or if any then in times of flood, producing interlamination of marl and clays. Such deposits occur under the peat on the sites of former shallow lakes in Ireland and Scotland. Fresh-water limestones and clays of similar origin occur on a larger scale in the Eocene rocks of Wyoming, and in the Miocene of Switzerland and Auvergne. The shell sand of the Crag is practically a marine marl. As marl is a very valuable substance to add to stiff clay land, both because it lightens the soil and because it furnishes it with lime, the term *marling* is sometimes extended by farmers to the addition of merely sandy soil, and such loam (q.v.) is miscalled marl.

Marlborough. 1. An old town in Wiltshire, stands on the left bank of the Kennet, 10 miles S. of Swindon. To the south-west of the town is a British mound, on which a castle was built by William I. Here was held the Parliament of 1267, at which the Statutes of Marleberge were enacted after the Barons' War. The castle was for long after a royal residence, was taken in the Great Rebellion, and nearly burnt down in 1653. In 1843 the mansion erected near its site in the reign of Charles II. was converted into Marlborough College. Marlborough had long been a municipal borough when, in 1885, it was disfranchised. Pop. (1901), 3,046.

2. A district in New Zealand, in the north-east of the South Island, the area of which is 3,000,000 acres. A great part is under pasture; and gold, copper, and other minerals are found.

Marlborough, JOHN CHURCHILL, DUKE OF, eldest son of Sir Winston Churchill, was born in 1650. He became a page to James, Duke of York, being introduced to his notice by his sister Arabella, who was the duke's mistress. Entering the army at an early age, Churchill served under Monmouth in Scotland, and with the French against Holland. Turenne was his master in the art of war. In 1678, when he married, he became colonel of the Life Guards, and, on the accession of his patron to the throne, was made a peer. He served James

skilfully in the Monmouth rebellion, but deserted him at the Revolution. Though he had been in favour of a regency, William III. recognised his abilities by making him a Privy Councillor and an earl, and by employing him in a military capacity in Ireland and Flanders. No sooner, however, was James back in France than Marlborough began to intrigue with him, and received a pardon from him for past offences. His real object, the setting up of Anne against both James and William, appears to have been divined by the Jacobites. When it was discovered by William in 1692, Marlborough was dismissed. He now joined the Tories, or anti-Dutch party, at the same time continuing his Jacobite intrigues. In 1696 he was implicated in Sir John Fenwick's plot, but generously forgiven by the king. Towards the end of the reign he regained William's confidence, and was not only made commander-in-chief, but also entrusted with important foreign negotiations. On the accession of Anne, Marlborough became all powerful. He induced the Tories to consent to the war with France, and himself assumed the command of the English and Dutch forces. In the ensuing war he was victorious at Blenheim, Ramilies, and Oudenarde over the best generals of Louis XIV., and was rewarded with a dukedom and the grant of a palace and estate near Woodstock, named after his greatest victory. Marlborough's position in England was never, however, completely secure. He was averse to party government, and tried to make himself an independent position by securing the governorship of the Netherlands from the Archduke Charles and the captain-generalship for life in England. The latter was refused like the former; for it came at a time when Anne was getting tired of the Whigs and of the arrogance of the Duchess of Marlborough. At the end of 1710 the duke was charged with receiving commissions on the supply of bread to the troops and on subsidies to the allies, and was dismissed. His career was over, and he retired to the Continent, where he corresponded both with the Jacobins and the Elector of Hanover. The result was that when he returned on the death of Anne, although he was made commander-in-chief, he was never again trusted with political power. He died at Blenheim Palace in 1722, having for some years nearly lost his faculties. His wife, Sarah, Duchess of Marlborough (the "Atossa" of Pope), to whom he was much attached, and who served him greatly with Anne till displaced in 1710 by Mrs. Masham, died in 1744 in her eighty-fifth year.

Marlitt, EUGENIE, *nom de plume* of E. JOHN, a German novelist. She was born in 1825 at Arnstadt, Thuringia, and entered upon a theatrical career, which she was obliged to abandon through illness. She afterwards acted as amanuensis to the Princess of Schwarzburg-Sonderhausen, her early patron. In 1863 she began to write romances, among the best of which were *Goldelse* (1866), *The Old Maid's Secret* (1867), and *Countess Gisela* (1869). She died in 1887.

Marlowe, CHRISTOPHER (1564-93), is supposed to have been the son of a Canterbury shoemaker.

After leaving the King's School there, he went to Corpus Christi (then Benet College), Cambridge, and took his degrees in Arts. We know little of his life before he began writing. It is certain that he was killed in a tavern brawl at Deptford in May, 1593. Marlowe was great both as a dramatic and a lyric poet. His *Tamburlaine the Great*, printed in 1590, but acted probably some years earlier, is memorable chiefly as the first example of blank verse worthy of the name. The *Tragical History of Doctor Faustus*, on the other hand, the first edition of which is of the date 1604, has both dramatic power and contains passages of intense lyrical beauty. The *Jew of Malta* is strong in the first two acts, but thenceforth degenerates. *Edward II.*, produced about 1590, is Marlowe's most finished work. Marlowe had a great share in some plays popularly ascribed to Shakespeare, such as *King Henry VI.* and *Titus Andronicus*. Marlowe's unfinished lyric, *Hero and Leander* (1598), is one of the most beautiful in the language. Chapman was entrusted by the author with its completion. The pastoral poem, *Come Live with me, and be my Love*, which is generally printed in volumes containing Shakespeare's sonnets and lyrics, is also most probably Marlowe's.

Marmalade, originally a confection of quinces (Portuguese, *marmelo* = "quince"), a preserve of fruit boiled with sugar, now mostly confined to a pulpy preserve of oranges or lemons or quinces.

Marmion, SHAKERLEY (1602-39), an English dramatist, was born in Northamptonshire. After leaving Oxford, he ran through his fortune and served as a soldier in the Netherlands. He died at London, whither he was obliged to return when on his way to serve in the expedition against the Scots. He was author of *Holland's Leagues* and two other comedies, and an epic, *Cupid and Psyche*.

Marmont, AUGUSTE FRÉDÉRIC VIESSE DE, DUC DE RAGUSA (1774-1852), the last to survive of Napoleon's marshals, was a native of Châtillon-sur-Seine. Having entered the army just before the Revolution, he was an artillery officer when he met Bonaparte at Toulon. In the Italian campaign of 1796 he acted as his aide-de-camp, and in Egypt two years later he was a general of brigade. For his services on the day of 18 Brumaire he was made a Councillor of State, and, as commander-in-chief of the artillery reserve, directed the crossing of the Great St. Bernard and was present at Marengo. He was named Duc de Ragusa in 1808 for his able administration of Dalmatia, and Maréchal de France after Wagram in 1809. In 1811 he was transferred from Illyria to the command in Portugal, but was defeated by Wellington at Salamanca in the next year. In the campaign of 1813 he defended the approaches to Paris with great ability; but, on account of his want of success, he was excepted from the amnesty proclaimed by Napoleon to those marshals who had accepted the Bourbons at the first restoration. In 1830 he emerged from retirement in order to take command of the royal troops, and after the Revolution was dismissed and retired to Venice.

Marmontel, JEAN FRANÇOIS (1723-99), a French writer and encyclopædist, was born in Limousin and educated by the Jesuits of Mauriac. In 1745, on the advice of Voltaire, he came to Paris, and in the succeeding years produced several tragedies. He also contributed to the *Encyclopédie* a series of articles which were republished as *Éléments de Littérature*, on which and his *Contes Moraux* (1761) his reputation rests. His *Bélisaire*, an epic romance, was chiefly remarkable for a chapter which was censured by the Sorbonne for its advocacy of religious toleration. In 1783 he was appointed secretary to the Académie and historiographer of France. Marmontel was ruined at the Revolution, and died in a village near Evreux.

Marmora, SEA OF. [BLACK SEA.]

Marmoset, any individual of the South American family Hapalidæ, the smallest known monkeys, some being only a few inches long. They are also called Squirrel Monkeys from their form, and Ouistitis from their whistling cry. They make affectionate pets, but are very sensitive to cold and need great attention. They have bred in captivity in England.

Marmot, any individual of the genus *Arctomys* of the Squirrel family, with about a dozen species



MARMOT (*Arctomys marmotta*).

from North America, the mountains of Central Europe, and Central Asia. They are stoutly built, with short ears and tail, live in burrows, often gregariously, feed on roots and leaves, and hibernate. *A. marmotta*, the Common or Alpine Marmot, is about the size of a rabbit, with brownish-red fur above, lighter beneath. The American species are called groundhogs or woodchucks. [PRAIRIE DOG.]

Marne, a river of France which gives its name to two departments. Rising in the hilly country north of Langres, it flows in a north-westerly direction for some 300 miles till it joins the Seine at Charenton. It is navigable as far as St. Dizier, and is connected by canals with the Rhine and the Aisne, as well as with the Seine. The department of Marne has an area of 3,159 square miles, and has Aisne and Ardennes on the north, Aube on the south, Seine-et-Marne on the west, and Meuse on the east. From the vines grown in the north the best champagne is made; in other parts of the department there is excellent pasturage, and good root crops are raised. Châlons and Rheims are the chief towns. Haute-Marne lies to the south-east

between Aube, Vosges, Meuse and Côte d'Or. It has an area of 2,402 square miles. Large quantities of iron ore are obtained from the soil, and much wine is made. Chaumont is the chief town.

Marnix, PHILIP VAN, COMTE DE ST. ALDEGONDE (1538-98), a famous Dutch patriot and writer, was born at Brussels and educated at Geneva. On his return to the Netherlands he put his Calvinistic principles into practice. He took an active part in the revolt against Spain, and in 1572 represented his friend William of Orange at the meeting of the Estates at Dort. He made great efforts as a diplomatist to obtain help from Elizabeth and from France, and to him was owing in great measure the formation of the Union of Utrecht. In 1583-84 he for more than a year defended Antwerp against the Spaniards, but his ultimate capitulation made him so unpopular that he spent the rest of his days in literary retirement, dying at Leyden in 1598.

Maronites, a Syrian people occupying the western slopes of Mount Lebanon and neighbouring coastlands, traditionally descended or named from a patriarch Maronius, and formerly monothelites, but in 1215 united to Rome, though retaining some peculiar national rites and privileges, such as celebrating the *Latin* mass in the *Syrian* language. At present, however, all speak Arabic exclusively. Population, about 230,000. For their long wars with their pagan Druze neighbours *see* DRUZES.

Marot, CLÉMENT (1496?-1544), one of the best of French early poets, was born at Cahors some time in the winter of 1496-97. He and his father found patrons in Francis I. and his sister, Marguerite, afterwards Queen of Navarre, who pensioned Clément; to her he dedicated his poems. He went with Francis to Italy in 1524, and was wounded at Pavia. Soon after his return he was imprisoned for heresy. He was rescued from prison by Marguerite on this occasion, and again in 1531, but in 1535 was advised to leave France. He took refuge at Ferrara, and from thence went to Venice, but was allowed to return to France in 1539. He then published a translation of the Psalms, which, though highly popular, was condemned by the Sorbonne. The unorthodox views and satirical tongue of Marot combined to make him enemies, and in 1543 he was obliged to leave Paris for Geneva. Calvin's austerity was too much for him, and he next went to Piedmont, and died at Turin.

Marozia, a Roman lady of noble birth but scandalous reputation, was the daughter of the notorious Theodora. She was a great power in Italy in the 10th century owing to her connection with Pope Sergius III. She procured the deposition of John X., and the election of her own son as John XI., as well as the succession of her grandsons, John XII. and Leo VII. She died in prison in 938.

Marquesas, or MENDANA ISLANDS, THE, are situated in the South Pacific between lat. 8° and 11° S. and long. 138° and 141° W. They consist of the five islands discovered by Mendaña in 1595, and seven others discovered by an American named

Ingraham in 1797. Nuka Hiva and Hiwaoa are the names of the largest. The inhabitants, who have largely decreased in numbers, are fine specimens of the North Polynesian race. In 1842 these islands were placed under the protectorate of France.

Marquis, MARQUESS, a title of nobility, originally a governor of a frontier or march, now a nobleman next in rank below a duke (whose eldest sons generally bear the title by courtesy), and above an earl or count. The first titular marquis in England was created in 1387—namely, Robert de Vere, Earl of Oxford, Marquis of Dublin.

Marriage among civilised peoples is the legal union of a man and a woman in the relation of husband and wife. By anthropologists the term is used in a much wider sense, and denotes any union of the sexes sanctioned by the community, and founded on the contract which is of the essence of marriage, as we understand the term, though authorities are not agreed as to the last condition. The union may be lasting or temporary, there may be a plurality of husbands to one wife, or a plurality of wives to one husband; but if it becomes a "recognised right, protected by the tribe," it is entitled to the name of marriage. Whatever may have been the sexual relations of primitive man, there can be no doubt that, from the modern standpoint, they were very lax. Some authorities believe that the condition of affairs is best described as "promiscuity," which is sometimes dignified with the title "communal marriage," in which, according to Lord Avebury, "all the men and women in a small community were regarded as equally married to one another." But since no individual could appropriate what belonged to the community, it follows that no man could have a wife to himself. Against this state of affairs Bachofen considers the women rose in revolt, and introduced monogamy "not without an appeal to force." A more probable view is that it was "gradually superseded by individual marriage, founded on capture," of which custom two well-known examples are the Rape of the Sabines and the carrying off of the daughters of Shiloh by the sons of Benjamin (Judges xx. xxi.). As civilisation increased other methods of procuring wives were adopted, but customs which were doubtless survivals of the practice long lingered even in Europe; and Darwin suggested that the "best man" was originally the chief abettor of the bridegroom in the act of capture. With marriage by capture was closely related the practice of exogamy, or the interdiction of marriage between persons of the same totem-clan. But the nature of the relation is by no means clear. Primitive man must have formed sexual connections with his own kindred, and the practice of infanticide (q.v.) must have limited the number of women, and so led to the practice of capturing women from another group for wives. This custom, long continued, would tend to acquire the force of law, till what was begun from necessity would be continued after the necessity had ceased to exist. Exogamy has been very prevalent, and is still the rule among some of the American Indians, the aborigines of Australia,

the Brahmins, and the Chinese. Amongst ourselves it is limited to blood relationships, and finds expression in the Table of Prohibited Degrees. Endogamy—which forbids marriage except between those akin, that is, between those of the same group—has also had a wide range. It may have arisen from tribal jealousy—a despising of “the daughters of Heth.” Lord Avebury suggests that the difference between endogamous and exogamous tribes arose from the proportion of the sexes, and that where male children were in excess exogamy would prevail, and that where girls were in excess endogamy would be practised. [FAMILY.]

The law of marriage is founded partly on Statute and partly on Common Law. In George II.'s reign it was enacted that the publication of banns and the solemnisation in one of the churches where they had been published was required, and that two witnesses besides the minister should be present, and that the register should be signed by the minister, parties, and witnesses. The statute as to the formalities of the marriage was strictly confined to England, from which circumstance what were known as Gretna Green marriages were valid. A later statute and other subsequent statutes provide for the validity of marriages celebrated in churches and chapels without the publication of banns [BANNS]; and by other statutes, marriages by or without licenses may be solemnised by virtue of the superintendent registrar's certificate. By the Common Law of England the requisites to the validity of marriage are:—

1. The presence of a priest in holy orders.
2. The presence of witnesses.
3. The consent of the parties.
4. The formalities of marriage as defined by the *lex loci actus* must be observed.
5. The essentials of the marriage as defined by the *lex domicilii*, including therein all questions of personal capacity or incapacity, must be observed.
6. The parties must not be within the prohibited degrees of consanguinity or of affinity, and for this purpose illegitimate relationship counts, but the consent of parents is not necessary.

As regards Scotland the marriage law is different, the consent of parties alone being sufficient to constitute the contract, and children born out of wedlock in that country, as in most others, become legitimate by the subsequent marriage of the parents, whereas in England the marriage ceremony must precede the births of children to render them legitimate. In the United States, as a general rule, no particular form is necessary to constitute a valid marriage if the consent of the spouses is proved. In some states the marriage must be authorised by a grant of license. In the eyes of the law, marriage is a civil contract merely; but it is held throughout Christendom to have a religious sanction also.

Marryat, FREDERICK, CAPTAIN (1792–1848), sailor and novelist, was the second son of Joseph Marryat, M.P., agent for Grenada. He several times ran away from school in order to go to sea, and at the age of fourteen was allowed to enter the navy. He was for more than two years a midshipman in Lord Cochrane's ship, the *Impérieuse*, which cruised in the Mediterranean during the French war. He greatly distinguished himself in

action, and soon after the peace attained the rank of commander. He was afterwards employed in the Burmese War of 1824–25, and had in 1819 been elected F.R.S. His first novel, *Frank Mildmay*, was written on board ship; but a year later, in 1830, he relinquished active service and settled at Hammer-smith. From 1832 to 1836 he edited the *Metropolitan Magazine*, in which appeared *Peter Simple*, *Japhet in Search of a Father*, *Jacob Faithful*, and others of his novels. The best of these were *Mr. Midshipman Easy* (1834) and *Snarley Yow: or, the Dog Fiend* (1837). After the publication of the latter he was in America for two years, the result of his visit being *The Phantom Ship* and *Diary in America*. In 1847 the news of the loss of his eldest son on the *Avenger* hastened his death, which occurred the following year.

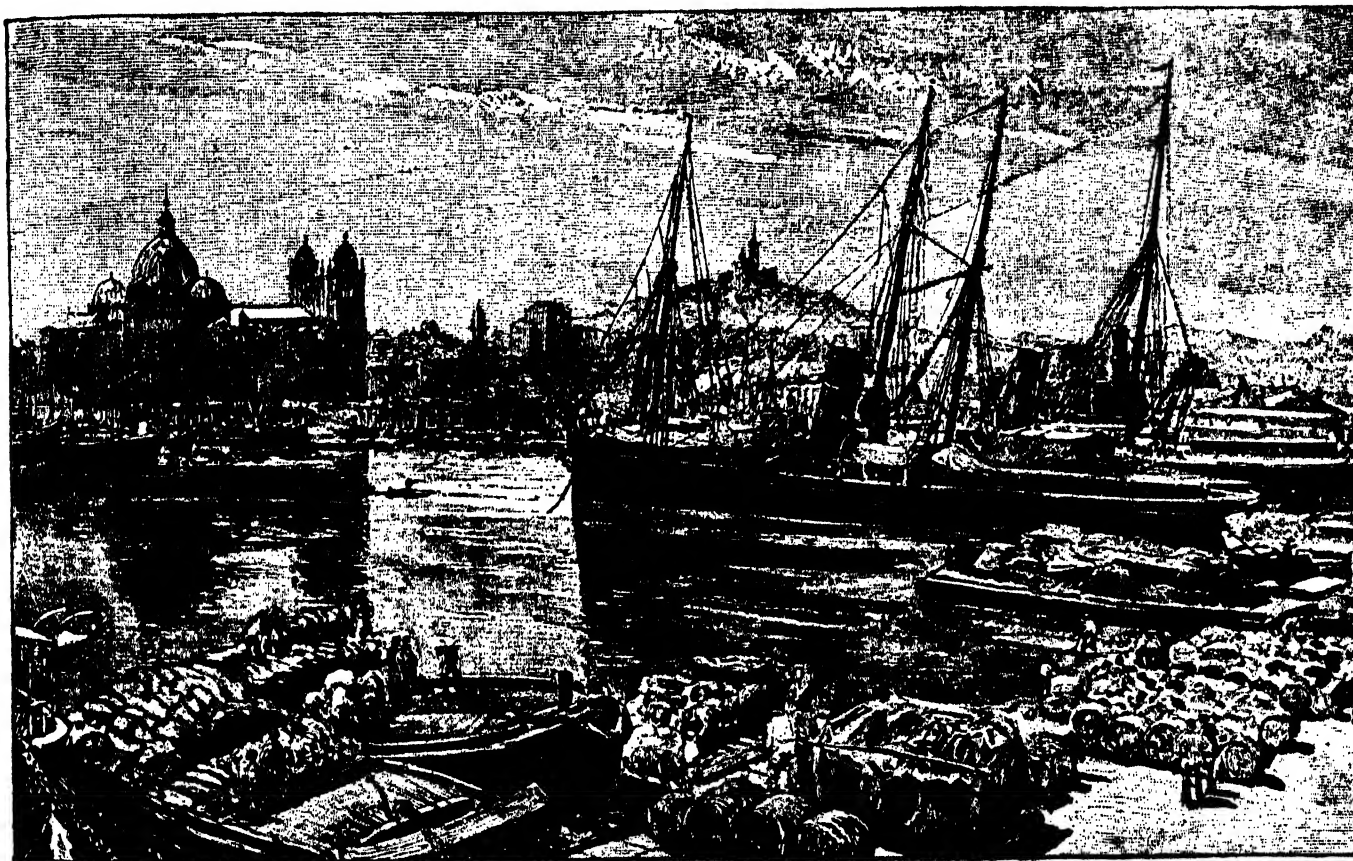
Mars, one of the planets in the solar system, has its orbit outside that of the Earth, and is therefore one of the so-called superior planets. At its nearest position Mars is 48,000,000 miles from the Earth, no other planet except Venus approaching us more nearly. Its diameter is about 4,200 miles; so its surface is only two-fifths as extensive as the Earth's. Its density is much less—about three-quarters that of the Earth; so a pound weight placed on its surface would not weigh much more than six ounces, and a ponderous elephant would, if there, be able to jump about with the agility of a fawn. Mars travels in an orbit whose centre is 130,000,000 miles away from the sun; when nearest to the sun, it is 128,000,000 miles away. When farthest from it, the distance is 155,000,000 miles, the average distance being about 141,000,000 miles. The heat and light which Mars receives from the sun, therefore, vary enormously, and so cause a difference in the lengths of winter and summer in his N. and S. hemispheres, the seasons in the N. hemisphere being far more temperate than those in the S. The Martian year is about 687 of our days, and its day 40 minutes longer than ours. Viewed with the telescope, large dark green spots are seen, the rest of the surface being of a ruddy tint, except at the two poles, where two white spots are observed and considered to be due to large masses of snow and ice. It has been supposed that the greenish spots are oceans, and the ruddy parts land. The spectroscope has shown that watery vapour is present in Mars' atmosphere, and appearances like huge rain-clouds sometimes obscure a part of the planet for a considerable period. Physical processes seem to go on there much the same as on our planet; hence many believe that Mars is inhabited and forms, in fact, a miniature picture of the Earth.

Mars, or MAVORS, was the Italian god of war, corresponding to the Ares of the Greeks. As the traditional father of Romulus (q.v.), he was also regarded as a specially Roman god, and was styled Marspiter (“Father Mars”). By the Romans he was also called Quirinus, the god of the Quirites, or citizens. The field where the Roman youth trained themselves in arms and athletic exercises was known as the Campus Martius; the first month of the year bore the name of the god; and the

annual games were called *Ludi Martiales*. Temples of Mars were numerous at Rome ; his priests, called the *Salii*, were clad in armour. The wolf and woodpecker were sacred to him.

Mars, ANNE FRANÇOISE (1779-1847), a great French actress, was the natural daughter of an actor named Monvel and an actress named Mars. She made her *début* in 1792, and seven years later became a *sociétaire* of the Comédie Française. She played with great success in Molière and Marivaux,

Marseilles (French *Marseille*), the third town of France and its chief port, is the capital of the department of Bouches du Rhone. A colony was founded here and called Massalia by the Phocæan Greeks in the 7th century B.C., and soon became an important trading centre, which founded colonies of its own on all the shores of the Mediterranean. In return for its assistance against Carthage the Romans left it as a *civitas foederata*, or nominal ally but not subject of Rome. In 1112 the town became a free republic, and during



MARSEILLES : THE DOCKS.

as well as in Scribe and Delavigne ; and "created" Dona Sol in *Hernani* and the *title-rôle* in Dumas's *Madame de Belleisle*. She took leave of the stage in 1841, and died at Paris six years later.

Marsala, a seaport at the westernmost point of the heel of Sicily, stands on the site of the ancient Lilybæum. It was for two centuries in the hands of the Saracens, who were driven out by the Normans in the 11th century. Here Garibaldi landed in 1860. The harbour, which had been disused for nearly three centuries, was reconstructed in the 19th century ; it is defended by a citadel. The trade in Marsala wine, now large, dates only from 1802, when it was supplied to the British fleet.

Marseillaise, THE, so called because introduced into Paris by patriots from Marseilles, is the national anthem of the French republic, composed at Strasburg in April, 1792, by Rouget de Lisle, an officer of engineers, as the war song of the army of the Rhine.

the Crusades it regained its early importance. It played an important part during the French religious wars and during the French Revolution. It lost its ancient liberties when taken in 1660 by Louis XIV. In 1871 it continued its revolutionary traditions by proclaiming the Commune. Marseilles is almost equally important as a commercial and a manufacturing city. More than 8,000 vessels enter its harbour every year, and it is the headquarters of the Messageries Maritimes and several other great trading companies. The old harbour has an area of nearly 70 acres ; and, besides this, there are numerous new docks and quays farther west covering even a greater surface, and an outer roadstead. Great quantities of soap and oil-cake are made, and there are important leather manufactories, large flour-mills, and extensive wine-vaults. Other important industries are metal-working and sugar-refining. The chief imports are cereals and silk. The most interesting buildings in Marseilles are the church of Notre Dame de la Garde, built in 1864, on the site of a 13th-century building, and containing

an image of the Virgin, the special protection of sailors; that of St. Victor, built in 1200, having 11th-century catacombs; and the Longchamps palace, a fine modern building.

Marsh, GEORGE PERKINS (1801-82), American philologist, author of *The Origin and History of the English Language* (1862) and some miscellaneous works, including *The Camel: His Organisation, Habits, and Uses* (1856). He was born at Woodstock, Vermont, and graduated in 1820 at Dartmouth College, New Hampshire. Having already been a member of the Executive Council of Vermont, he sat in Congress from 1842 to 1849, when he was appointed United States minister at Constantinople. In 1852 he went on a special mission to Greece, and was appointed ambassador to Italy in 1861. He died at Vallombrosa.

Marshal, originally a king's or great noble's "horse-servant," i.e. groom or farrier, an official whose duties came to include those of master of the ceremonies and chief usher. He is now represented in England by the hereditary Earl Marshal. In military establishments a marshal or field-marshal is a field-officer of the highest rank, to whom only a commander-in-chief is superior. The term is applied to officials of various kinds, e.g. the executive and administrative officer of a judicial district in the United States.

Marshall, JOHN (1755-1835), a great American lawyer, was a native of Fauquier county, Virginia. After serving under his father in the American war, he, in 1781, began to practise as a lawyer. He soon became head of the Virginian bar, and was several times elected to the Legislature of the state. In 1788 he assisted Madison to obtain the acceptance of the Federal Constitution; and in 1797 went to France as one of the special envoys of the United States. Soon after his return he was elected to Congress, and in 1800 became Secretary of State, but resigned in the next year in order to take the office of Chief Justice of the United States. His decisions as such have always been regarded as of the first importance; a selection of them appeared at Boston in 1839.

Marshall Islands, an archipelago in the West Pacific, situated to the east of the Caroline Islands, consist of two groups of coral reefs, called respectively the Ratak and the Ralik chains. The whole thirty islands have an area of about 107 square miles. They were annexed by Germany in 1885. Cocoa-nut palms and bread-fruit trees abound, and copra is exported. The inhabitants are skilful weavers.

Marsh Gas. [METHANE.]

Marsh's Test for arsenic is one very commonly adopted for the examination of liquors, etc., suspected to contain arsenic. The liquor is added to a flask, from which hydrogen is evolved by the action of sulphuric acid and zinc. Arseniuretted hydrogen is so formed, and passes through combustion tubing heated by three or four bunsen burners, when it decomposes and arsenic becomes deposited as a brown stain in the cool portions of

the tube. It is, of course, necessary to take great care to ensure the complete absence of arsenic in all the reagents employed.

Marston, JOHN, a satirist and playwright of the Shakespearean age, was born in Shropshire about 1575, and educated at Brasenose College, Oxford. In 1598 he wrote a satire called *The Scourge of Villanie*, and in the same year *Pygmalion's Image*, which he put forward as a parody of poems like *Venus and Adonis*. He was himself ridiculed by Ben Jonson in *The Poetaster* and other works, but afterwards collaborated with him and Chapman in a play called *Eastward Ho!* for certain political allusions in which the authors were imprisoned. Marston's own best plays were *The Malcontent* (1604), *The Dutch Courtesan* (1605), and the horrible tragedy of *Sophonisba* (1606). Marston appears to have taken orders some year between 1607 and 1616. He died in London in 1634.

Marston, JOHN WESTLAND (1820-90), a dramatist of the school of Knowles and Bulwer, was a native of Boston, Lincolnshire. He was articled to his uncle, a London solicitor, in 1834, but soon devoted himself to literature. His most popular play was his first, *The Patrician's Daughter*, produced by Macready at Drury Lane in 1841. Mr. Charles Kean appeared in his *Strathmore* and other plays, Helen Faucit in *Madame de Meranie* (1856), and Miss Neilson in *Life for Life* (1868). He also wrote lyrics of some merit, and *Our Recent Actors* (1888).

Marston, PHILIP BOURKE (1850-87), son of the foregoing, when quite young became blind, and to this misfortune was added the sorrow caused by the death of his betrothed. These things gave his poetry a mournful tone. *Song Tide* (1870), *All in All* (1875), and *Wind Voices*, are the titles given to his volumes of poems. Philip Marston was the friend of Rossetti and Swinburne, who had a high estimate of his powers.

Marston Moor, the scene of one of the great battles of the Civil War, which took place July 2, 1644, is 7 miles N.W. of the city of York. The two armies were about equal in numbers, the Royalists being commanded by Prince Rupert, and the Parliamentarians by Fairfax, Manchester, and Leslie, Earl of Leven, who headed a Scots contingent. The king's cavalry at first carried all before them, but the day was retrieved by Cromwell's Ironsides. The Cavaliers lost 4,000 men, and never recovered their prestige.

Marsupials (*Marsupialia*, the *Didelphia* of De Blainville, and the *Metatheria* of Huxley), a sub-class of mammals in which there is no organic connection between the mother and the young during the short intra-uterine life of the latter, which are born in a very imperfect condition, and carried for some time in the abdominal pouch (*marsupium*), whence the sub-class derives one of its names, and there suckled from the enclosed teats. There are six families, forming two groups.

I. POLYPROLODONT (of more or less carnivorous habits, with numerous small incisors and large canines):—

- Fam. 1. Didelphyidæ. [OPOSSUM.]
 „ 2. Dasyuridæ. [DASYURE, THYLACINE.]
 „ 3. Peramelidæ. [BANDICOOT.]

II. DIPROTODONT (with the central incisors prominent, and the lateral incisors and canines small or absent):—

- Fam. 4. Phascologydæ. [WOMBAT.]
 „ 5. Phalangeridæ. [PHALANGER.]
 „ 6. Macropodidæ. [KANGAROO.]

With the exception of the first family, which is American, the sub-class is confined to the Australian region.

Marten, any individual of the genus *Mustela*, of the Arctoid family Mustelidæ, with seven species from the northern parts of both hemispheres. They resemble weasels in form, but are of larger size, with bushy tail, arboreal in habit, and feed on birds and eggs, small mammals, reptiles, and amphibians. The fur is of commercial value. [SABLE.] The largest species, the Pekan (*M. pennanti*), from North America, with blackish fur, may have a total length of about four feet. It is sometimes called the Fisher Marten, but probably without foundation. The only British species, the Pine Marten (*M. martes*), has rich brown fur. The European Beech or Stone Marten (*M. foina*), supposed by Rolleston to have been the "cat" of classic times, has greyish brown fur, and a white throat. An Indian species (*M. cathia*) is domesticated, and is used to drive away rats and mice.

Martial (MARCUS VALERIUS MARTIALIS), the Latin epigrammatic poet, was born about the year 40 at Bilbilis in Spain, near the source of the Tagus. His parents' names were Fronto and Flaccilla. He came to Rome at an early age, and stayed there till the year 91, living on the patronage of Calpurnius Piso, the Senecas, Titus, and Domitian, whose favour he returned by fulsome eulogies. Although he had a small estate at Nomentum, he was always needy, and at times quite without resources. He seemed to prefer this to practising as an advocate, as his friend Quintilian had advised him. When he revisited his native land he appears to have been protected by a cultured lady named Marcella. He died about 102 or 103. His earliest work, the *Liber Spectaculorum*, was composed at the end of the reign of Titus. The first nine books of the *Epigrams* appeared in the reign of Domitian; book xi. in 86, the year of Nerva's accession; and a revised edition of book i. in 98. The last book was written in Spain shortly before his death. For literary polish and shameless grossness of description, flattery, and abuse, Martial is unrivalled.

Martial Law, a series of regulations made to preserve order and discipline in the army, and enforced by the prompt decisions of courts martial; this is generally known as military law. During the existence of a rebellion, when, in consequence of the ordinary processes of law becoming ineffectual for the security of life and property in any province or state, the Legislature has appointed that a

military force shall be employed to suppress the disorders and secure the offenders; and when the trial of the latter takes place according to the practice of military courts, that province or state is said to be subject to martial law. On such an event occurring in any part of the British dominions, the two Houses of Parliament jointly with the Crown determine that a temporary suspension of the Habeas Corpus Act shall take place. This course is only adopted in cases of great emergency, and the necessity for it and the period of its duration are always set forth in the provisions of the Act. [HABEAS CORPUS.]

Martin. [SWALLOW.]

Martin, Bishop of Tours, was born about 320, and died about 400. He was a native of Pannonia, but was educated at Pavia. After serving in the Imperial army under Constantine and Julian, he returned to his native country for a time, but left it about 360 for Gaul. In 371 he was taken from his convent near Poitiers and made Bishop of Tours against his will. His fame as a worker of miracles, which are recorded in his life by Sulpicius Severus, drew crowds of visitors to see him. He died at the monastery of Marmoutiers, which he had himself founded. He was canonised, and his festival is celebrated on November 11, which is still known in Scotland as Martinmas, the beginning of winter. The story of his dividing his cloak with a beggar, frequently forms a subject for the painter.

Martin, BON LOUIS HENRI (1810-83), the great French historian, was born at St. Quentin and trained for a legal career. He soon, however, made up his mind to write, and began by publishing some historical romances, three of which deal with the Fronde period. He then contributed a short history of Germany, Switzerland, and the Netherlands to the *Bibliothèque Populaire*, and in 1833, in conjunction with Paul Lacroix, entered upon a compilation of French history from chronicles and histories. His great work, *The History of France*, from the earliest times to 1789, was begun in 1833 and finished in 1836. The third edition, which was largely extended, was finished in 1854, and received the Gobert Prize. The fourth, in seventeen volumes, was further improved, and published in 1860. It was awarded the prize of the Institute in 1869. The crown to his literary career was his election to the Académie Française in 1878. In politics Martin was a strong republican. He became a deputy in 1871, and a senator in 1876.

Martin, SIR GEORGE, was born in 1764, entered the navy in 1771, and shared in Rodney's three actions in 1780. He became a commander in 1782, and a captain in 1783. He took part in the battle of St. Vincent. In 1800 he took charge of the blockade of Malta, the capitulation of which he received. He died in 1847.

Martin, JOHN (1789-1854), a painter, very popular in his day, was born near Hexham, in Northumberland, and in 1806 came to London. Of his sixteen huge canvases, which were considered by some critics of the day superior to Turner,

Belshazzar's Feast and *The Eve of the Deluge* are best known.

Martin, SIR THEODORE (1816-1909), was the son of an Edinburgh solicitor. He adopted his father's profession and practised for some years in Edinburgh and London, and first became known as a writer by the publication of the *Bon Gaultier* ballads, some of which were written by Aytoun. In biography he produced lives of the Prince Consort and Lord Lyndhurst; and as a translator he distinguished himself by creditable versions of Horace's *Odes*, Catullus, Dante's *Vita Nuova*, of Danish poems, and, above all, of the works of Goethe and Heine. In 1851 he married Helen Faucit, the actress, who died in 1898.

Martin, SIR THOMAS BYAM, was born in 1773, entered the navy in 1782, and was made a commander in 1793 and a captain in the same year. He assisted in the reduction of Bastia. He became a rear-admiral in 1811, and after much further service died Admiral of the Fleet in 1854.

Martineau, HARRIET (1802-76), an English miscellaneous writer, was the daughter of a manufacturer at Norwich. Her careful Unitarian education stood her in good stead when in 1829 she found herself obliged to earn her own living. Very early she became almost completely deaf, but she had already written articles and short stories, and in 1830 gained prizes for some theological essays; but it was in 1832, when her *Illustrations of Political Economy* began to be published, that she achieved a reputation. In 1834 she paid a two years' visit to America, and on her return wrote *Society in America* and other descriptive works. She now contributed largely to Charles Knight's popular publications, and also wrote children's stories. From 1838 to 1844 illness interrupted her labours, but in the latter year she published a book against game laws. In 1846 she went to Egypt and Palestine and wrote a work on Eastern life. Her most important works were *The History of the Thirty Years' Peace* (1815-45), with an introductory volume; *Letters on the Laws of Man's Nature and Development*; and an epitome of Comte's *Philosophie Positive*. She was afterwards connected with the *Daily News*, and she left an *Autobiography*.

Martineau, JAMES, one of the ablest of modern English thinkers, was born in 1805. Miss Martineau was his elder sister. He was educated at Norwich grammar school, and under Lant Carpenter at Bristol. Originally intended for an engineer, he soon became interested in philosophical and theological subjects, and entered the Unitarian ministry. From Liverpool he went to Manchester New College, Manchester, in 1840, as professor of Mental and Moral Philosophy, and in 1848-49 attended lectures on metaphysics in Germany. In 1857 he came to London as professor and Unitarian minister, and in 1869 became principal of Manchester New College. He retired from that position in 1885, having some time before ceased his ministerial work. His candidature for the Chair of Mental Science at University College,

London, was defeated (chiefly by George Grote) on the ground that he was a minister. Chief among his works are *Essays Philosophical and Theological* (1868), *Hours of Thought* (1876-80), *Types of Ethical Theory* (1885), *A Study of Spinoza* (1882), *The Seat of Authority in Religion* (1890). He died in 1900. His *Life* was published in 1902.

Martinique (called *Martinico* by the Spaniards and *Madrena* by the natives), one of the West India islands, belongs to the Lesser Antilles. It is 43 miles long, and has an area of 380 square miles. Discovered in 1493 by the Spaniards, it was colonised by the French in the 17th century, and has ever since been held by them, except for short periods in the Seven Years' and Napoleonic wars, when it was captured by Great Britain. The island is mountainous in the north and south, and well-watered, but the climate is hot and unhealthy. Much sugar is cultivated and exported, and manioc, sweet potatoes, and bananas are grown. The work has been done by coolies since 1848. The principal towns, which are in the west, are Fort de France and St. Pierre, the former of which suffered a disastrous fire in 1890. In 1902 St. Pierre was almost entirely destroyed by a terrific volcanic eruption from Mont Pelée. Almost all the inhabitants perished.

Martius, KARL FRIEDRICH VON (1794-1868), German traveller, was born at Erlangen. He was the author of some important works describing his travels in Brazil as a member of a scientific expedition in 1817-20, and on the people and plants of that country. He died at Munich, where he had been professor of botany for nearly forty years.

Martyn, HENRY (1781-1812), missionary, was the son of a Cornish miner. He was Senior Wrangler at Cambridge, and Smith's prizeman in 1801, and was for a time curate under Charles Simeon, but in 1805 sailed for India as a military chaplain. He died at Tokat, in Asia Minor, when on his way from Persia to Europe. He translated the New Testament into Persian and Hindustani, and the Psalms also into Persian.

Martyr, one who bears witness (to his faith), especially a Christian who, in a time of persecution, suffered death rather than deny his faith. The term is loosely used in the sense of sufferer.

Marvell, ANDREW (1621-78), satirist, pamphleteer, and poet, was the son of the rector of Winestead, in Yorkshire. He was educated at Hull and at Trinity College, Cambridge. He then spent several years in travelling on the Continent, and in 1650 became tutor to Lord Fairfax's daughter. For a year, in 1657, in spite of his monarchical views, he was Milton's assistant as secretary to Cromwell, and next year entered Parliament as member for Hull. From 1663 to 1665 he was absent from his duties owing to his holding a diplomatic post; but, with the exception of this period, he attended regularly in Parliament, and wrote reports of the debates for his constituents, which are, in the absence of official reports, of considerable historical value. They end only with his death in 1678. Marvell's satires and pamphlets exercised considerable influence on public opinion.

A reward was offered for the discovery of *The Growth of Popery and Arbitrary Power* (1677); and *The Rehearsal Transposed* and *Mr. Smirke on the Divine in Mode*, written against an Oxford clergyman, were effective defences of religious toleration. His poems, written before his entrance into public life, are, says Lamb, distinguished by a witty delicacy.

Marx, KARL (1818-83), the Socialist writer and agitator, was born at Trier, where his father held a post in the Civil Service. He studied law and philosophy at Bonn and Berlin, and became an adherent of the young Hegelian school. In 1842 he began to edit the *Rhenish Gazette*, a revolutionary organ, after the suppression of which he went to Paris, where he assisted to conduct the *Deutsche Französische Jahrbücher*. In that organ he published several important articles, one of which was on the Hegelian philosophy of law. In 1844 Guizot expelled him from France at the request of the Prussian Government. He now settled at Brussels, where he continued to attack the government of his native province and published his reply to Proudhon's *Philosophie de la Misère*. Here also, in 1847, he published his Communist Manifesto, a declaration of the principles of International Socialism, which was soon circulated throughout Europe. Expelled from Brussels, Marx went to Paris in 1848 at the request of the Provisional Government, but left it for Cologne a few months later, and established with Engels and others the *New Rhenish Gazette*. The paper was twice unsuccessfully prosecuted, but in June, 1849, was suppressed. The rest of his life Marx spent (often in the utmost poverty) in London, where he wrote for the *New York Tribune*, and published various pamphlets and the *Kritik der Politischen Economie* in 1857, his first economical work. In 1864 the International Working Men's Association was founded, and Marx appointed to draw up its rules and deliver the first inaugural address, but in 1872 it died. Not long after this he retired from active life and devoted his time to the completion of his great work *Das Kapital*, the first volume of which had been published in 1867. When he died, at Hampstead, he left the second and third volumes in MS. His daughter, Mrs. ELEANOR MARX AVELING, was a well-known English Socialist.

Mary, a feminine name derived from the Hebrew, and used so often in the New Testament as to lead to some confusion as to the different bearers of it. The most illustrious of these is the mother of Christ. Little is known of her parentage, though tradition has much to say on the point, and, as to her later life, the general idea is that after the crucifixion she was under the care of St. John the Divine. The belief in her perpetual virginity is first found in the *Protevangelion Jacobi*, which makes her to have been brought up in the Temple, and the idea became general in the 4th century, and received authoritative sanction at the Council of Chalcedon (451). The belief in her immaculate conception was the product of the 12th century, and the vindication of her title of Mother of God dates from as early as the 3rd and 4th centuries. Of the many festivals of the Virgin, some

are common to several Christian churches; the festival, however, of the Assumption finds no place in the Anglican Church.

Mary I. (1516-58), Queen of England, was the daughter of Henry VIII. and Catharine of Aragon (q.v.), and began her life under favourable auspices, and had Cardinal Wolsey as godfather. At the age of ten she had a court of her own at Ludlow, and many arrangements were made from time to time as to her future marriage; but the divorce of Catharine and the ascendancy of Anne Boleyn wrought a great change in her circumstances. Declared illegitimate, she was subordinated to her younger sister, though the death of Anne Boleyn resulted in some amelioration. Her chief advisers were Gardiner and the Emperor Charles V., and her marriage with Philip, son of the latter, was the principal cause of her later unpopularity, as introducing the Spanish Inquisition into England, and as being in itself displeasing to the English.

Mary II. OF ENGLAND (1662-94) was the daughter of James II., by Anne Hyde, his first wife, and having married William of Orange (afterwards William III. of England), reigned conjointly with him after the abdication of her father.

Mary, QUEEN OF ENGLAND (b. May 26, 1867), Victoria Mary, daughter of Duke and Duchess of Teck. Married George Frederick Ernest Albert, then Duke of York, on July 6, 1893; became Princess of Wales 1902, and Queen Consort 1910.

Mary Stuart (1542-87) was the daughter of James V. of Scotland and Mary of Lorraine, and succeeded as a baby to the throne of her father. At the age of six she was betrothed to the Dauphin of France, and went to Paris to be trained. She was married in 1558, and three years after as Dowager Queen of France, she returned to her Scottish kingdom, now become almost alien to her in religion and in tastes. Her controversies and struggles with John Knox and his congeners were ominous of what was to come. At the outset of her reign her half-brother, Murray, and Maitland were her friends, and, although the affair of Chastelard may have done her some damage, it was not till her ill-fated marriage with Darnley that the tide of misfortune really set in. The murder of Rizzio, followed by that of Darnley, as to which the question of Mary's guilt or innocence has always been matter of doubt, her mysterious relations with Bothwell, her imprisonment at Lochleven, her abdication in favour of Murray as Regent, her escape from Lochleven by aid of George and Willie Douglas, and the battle of Langside, which crushed her prospects, followed each other in rapid succession; and in 1568 she took the next fatal step of her life in landing at Workington and trusting herself to the hospitality of her rival Elizabeth. The Queen of England imprisoned her for 20 years, and at various times the captive queen intrigued to gain her liberty. The plan of her marriage with the Duke of Norfolk gave dire offence to Elizabeth, and her real or supposed

concern in Babington's conspiracy was made the pretext for her removal to Fotheringay in 1586, and her trial and execution in 1587.

Maryland, so called after Henrietta Maria, wife of Charles I., in whose reign it was colonised, is one of the original thirteen states of North America, and is bounded on the N. by Pennsylvania and Delaware, on the E. by Delaware and the Atlantic, and on the S. and W. by Virginia and West Virginia. The state is of irregular shape, almost divided by Chesapeake Bay and the estuary of the Potomac, and of its 12,210 square miles of area water occupies 2,350. The length from E. to W. is 200 miles, with a width varying from 4 to 120 miles. There are no harbours on the coast-line, which is bordered by a shallow lagoon, but Chesapeake Bay, which is the largest inlet of the United States of America, and is 12 miles wide at the entrance between Capes Charles and Henry, and stretches N. for 200 miles with an average width of 10 miles increasing in parts to 40, has a deeply-indented shore-line, and contains many islands. The district to the E. of Chesapeake Bay, called the Eastern shore, is mostly level, while the peninsula between the Potomac and the W. of the bay is more undulating. The third part of the state rises to the mountainous land of the Blue Ridges and the Alleghanies. The Eastern shore has the rivers Pocomoke, Nanticoke, Choptank, and Elk, which are not navigable for any considerable distance. The Susquehanna falls into the head of the bay, and on the W. shore the Potomac is navigable for 125 miles to Washington city, the Patuxent for 40 miles, and there is the Patapsco, on which Baltimore is situate. All the rivers but one flow into Chesapeake Bay. The state produces good marble, chromium, soapstone, iron and copper ore, brick and porcelain clay, and in the W. are coal-fields, especially in one valley 20 miles long, where there is a seam of good steam coal 14 feet thick, besides iron ore. The soil of the Eastern coast and of the west peninsula is sand and clay, and is most productive of peaches and other fruits. The central districts and the mountain valleys are fertile, and there is much original forest in the W., the chief timber being oak, chestnut, beech, cedar, and (till lately) walnut. The bay and estuary abound in fish and waterfowl, among the latter being the canvas-back duck, and the oysters are renowned. The present capital is Annapolis, where is a State Naval Academy, but the mother-city was Baltimore, and this is also the chief port. Much traffic is carried on by the Chesapeake and Ohio Canal, Chesapeake and Delaware Canal, and the Baltimore and Ohio railway. The chief agricultural products besides fruit are tobacco, maize, and wheat; there are iron, steel and cotton manufactures. The original grant of the estate was made to Lord Baltimore, and 200 emigrants founded the settlement in 1634. As Lord Baltimore was a Catholic, the state became a refuge for Catholics, but religious toleration was practised.

Masaccio, TOMMASO GUIDI (1402-1429), an Italian painter, showed an early inclination for art, and in 1424 entered the Guild of Painters at Florence, afterwards studying at Pisa and Rome.

At Rome he executed some frescoes, *A Crucifixion*, and *Scenes from the Lives of St. Catherine and St. Clement*. But his name is chiefly associated with the Brancacci chapel at Florence, where, though some doubt exists as to what is his and what was done by Filippino Lippi and others, much of his undoubted work exists. Among this *The Temptation of Adam and Eve*, *The Expulsion from Eden*, and *St. Peter Baptising* are especially notable.

Masai, a large and powerful predatory people of East Equatorial Africa, whose ill-defined territory (Masailand) lies mainly on both sides of the equator on the elevated steppe lands between Lake Victoria and the Kilimanjaro and Kenia highlands, and stretches from about the parallel of Lake Rudolf (Samburo) southwards to Unyamwezi. But the Masai raids have in recent times extended far beyond these limits, the coastlands both about and below Mombasa having frequently been visited by these dreaded marauders during the present century. Their power, however, is now regarded as practically broken, partly by the establishment of orderly government in the territory of the British East Africa Company, partly by the fearful ravages of the cattle plague, which has wasted a great part of East Equatorial Africa for several years, and has thus deprived the Masai nomads of their main resource. Some have already offered to take service as police or carriers under the company; while others, like their Wa-Kwafi kindred in a previous generation, have turned to the peaceful pursuits of husbandry. Their ethnical relations have been much discussed by ethnologists, and present difficult problems, which have not yet been satisfactorily solved. They appear, however, to be a Negroid people of magnificent physique intermediate between the true Sudanese Negroes and the Ethiopian Hamites, inclining more towards the latter than the former both in appearance and in speech. The Masai language, as far as it has been studied, would seem to belong to the Hamitic Galla group; and, should this view be confirmed, it will be safe to conclude, as is now generally assumed, that the Masai are fundamentally Gallas greatly modified by long contact with the surrounding Negro populations. This conclusion is also confirmed by their traditions, their predatory habits and their preference for a nomad pastoral over a settled agricultural life. Joseph Thomson, by whom they were first visited and described (1883-84), speaks of the superior clans as "splendidly-built savages, the most magnificently-modelled men conceivable, not one under six feet," with straight European nose, thin, well-cut lips, prominent cheek-bones, jaws rarely prognathous, black hair, "a cross between the European and the Negro," and figures in general suggestive less of strength or of "the ideal Hercules" than of the Apollo type, "presenting a smoothness of outline which might be called almost effeminate" (*Through Masailand*, p. 427). The Masi, who call themselves Iloikob ("Freemen"), are divided into about twelve noble or superior clans, the *élite* of the nation, who owe each other no kind of allegiance and under whom are the Andorobbo and other servile tribes not regarded

as of pure Masai descent. The nobles do all the fighting and raiding, while the serfs till the land, carry on all trading transactions with the surrounding peoples, and hunt the elephant in the wooded districts. In the noble clans there are again two distinct classes, the old people who stay at home, marry, and tend the cattle, and the young men occupied exclusively with war and plundering expeditions. Polygamy, and even promiscuity, prevail, and their religion, which rejects a future life, is limited to a vague belief in *Ngai*, a mysterious being enthroned on the snowy heights of Kilimanjaro. There appear to be also one or two inferior deities; but their chief faith is in the *leibon*, wizards or medicine-men credited with supernatural powers, whose chief business is to propitiate, or turn away the wrath of *Ngai*. No Christian missionaries have yet undertaken the conversion of these lawless nomads.

Masaniello, TOMMASO ANIELLO (1623-47), a fisherman of Naples, became the chief instrument of a revolt against the tyranny of the Spanish viceroy, though the real moving spirit was a priest, who remained in the background. The immediate pretext for the revolt was a heavy tax levied upon fruit in 1647. The mob, under Masaniello's guidance, burnt the houses of some who were obnoxious to them and pillaged the city of arms, but not interfering with other property. He at first bore his honours meekly, and was able to dictate terms to the viceroy; but soon his mind gave way, and he committed so many extravagances that the populace wearied of him, and he was confined in a monastery, where he was assassinated. After his death a reaction set in, and he received a grand funeral.

Mashonaland, that part of East Africa S. of the Zambesi and containing many affluents of the Zambesi and Limpopo. It is a plateau of 4,000 feet high, extending to the Unvukwee Mountains, and enjoys a healthy climate; while there is good soil, plenty of grass and water, and other elements of making a successful colony. The people, who are fairly well civilised for Africans, were driven to the mountains and much harassed by the Matabili (q.v.). They are good husbandmen and good iron-workers, and they cultivate rice, maize, corn, cotton and tobacco. Iron, copper, and gold are found, and traces of gold-mines have given rise to the idea that the Ophir of antiquity was here. The region was taken under British protection in 1888, and by an arrangement with Lobengula, the chief of the Matabili, Colonel Pennefather made an expedition in 1889 and founded the town of Salisbury. The British South Africa Company undertook to administer the region in 1890; in 1896 a revolt against the company took place, but after some months quiet was restored. The railway from Beira to Salisbury was completed in 1899, and Salisbury is now in direct rail communication with Cape Town. The Mashonas, a large but feeble Bantu nation representing the aboriginal element in the region between the Limpopo and the Zambesi, but during the 19th century driven by the intruding Matabili to the hilly northern plateau, which from them takes the name of

Mashonaland, and is now being occupied by British settlers under the Chartered South Africa Company. The Mashonas eagerly accepted the British protectorate as their best defence against the plundering Matabili hordes; and since Mashonaland and Matabililand have been united under the name of Southern Rhodesia, prosperity and peace have taken the place of devastating strife, and the Mashonas, threatened at one time with extinction, are increasing in numbers every year, and where there were only 100,000 there are now about 461,000. The Mashonas are an inoffensive, industrious people, who till their lands with great care, raise cotton crops, with which they spin and weave coarse textiles, show much skill in basket-work and in the manufacture of iron implements. They have also long worked in a primitive way at the rich alluvial and quartz gold diggings of the plateau; but the mines, now being extensively worked by modern methods, show a decidedly marked increase in production. Mashonaland, and indeed the whole of Southern Rhodesia, holds out good prospects to the settler who is willing to work hard.

Masinissa, a Numidian prince of the 3rd century B.C., whose possessions on the borders of Carthage during the struggle of that state with the Romans enabled him to play an important game between the two powers. He first fought for Carthage in Spain against the Scipios, but in 206 he cast in his lot with the Romans. By the aid of Scipio he overcame his rival, Syphax, and firmly established himself. At the battle of Zama he commanded cavalry in Scipio's right wing, and his possession of all Numidia enabled him to harass Carthage and bring about the third Punic War, which crushed Carthage. He was an able ruler, and greatly advanced the good of his country.

Mask, MASQUE, a covering for the face with orifices before the eyes, nostrils, and mouth. The masks of Greek and Roman drama had hair attached



JESTER'S MASK (TIME OF HENRY VIII.)

to them, and it is thought that they generally covered the whole of the head and neck. Characters which did not present some special peculiarity of face were represented by typical masks, the types being numerous. The masks used in masquerades are generally screens which cover the upper part of the

face down to the mouth or to the tip of the nose, with openings before the eyes. The word *mask* used to be applied to a masked revel or masquerade, in which those who took part were disguised by masks. In the form *masque* (formerly also mask), the term denoted a pageant of a dramatic character generally based on allegorical or mythological subjects. Such pageants were in vogue during the 16th and the early part of the 17th centuries, and they developed into musical dramas. Ben Jonson and Milton composed masques.

Maskelyne, NEVIL, D.D., F.R.S. (1732-1811), was for nearly half a century Astronomer-Royal. He was born in London, and educated at Trinity College, Cambridge, of which he became fellow. In 1761 he was sent by the Royal Society to observe the transit of Venus at St. Helena, and during the voyage he introduced the practice of calculating longitude by lunar distances. In 1763 he went to Barbadoes to test chronometers, and in 1765 became Astronomer-Royal. He induced the Government to print annually his observations, a practice which has been continued with much advantage; and he was founder of the *Nautical Almanac*, which was first issued in 1766, having had a predecessor in the *British Mariner's Guide* (1763). Selections from his works were published in 1812. He also took interest in geodesy, and was concerned in the finding of the earth's density by means of experiments made at Schiehallion.

Mason, JOSIAH, SIR (1795-1881), renowned as the principal manufacturer of steel pens, was born poor at Kidderminster, but soon came to the front. His first important work was a share in the manufacture of split rings, and in 1829 he began to make pens for Perry and Co. From 1842 to 1865 he was a partner in the Elkington firm for electroplating, and bought a valuable patent from Siemens, and later he bought from Krupp for £10,000 a patent for rolling machinery. He was a generous man, founding the Josiah Mason College, Birmingham, an orphanage at Erdington at a cost of £260,000, and several almshouses.

Mason and Dixon's Line, in the United States, the boundary between Pennsylvania on the north and Maryland on the south, lat. 43° 30' N., named after the first surveyors; formerly the northern boundary of the Slave States.

Masrium, a new element, the probable existence of which in Egyptian minerals has lately been shown. As yet, however, nothing of importance is definitely known concerning it.

Mass. The celebration of the Lord's Supper, or Eucharist; it is generally used of the celebration in the Roman Catholic church. In music, a setting of such portions of the Latin liturgy of the Eucharist as are adapted for musical performance, including the *Kyrie*, the *Gloria*, the *Credo*, the *Sanctus*, the *Benedictus*, and the *Agnus Dei*. [REQUIEM.]

Massachusetts, a New England state of North America, one of the original thirteen. It is of irregular shape, having a length of 160 miles, with an average width of fifty; and Massachusetts Bay

on the east has 250 miles of coastline. The area is 8,040 square miles. In the south of the bay are the islands Martha's Vineyard (21 miles long by 6 broad, a great summer resort), Nantucket (inhabited by fishermen), and Elizabeth Island. On the coast are low plains with many small lakes; but the interior is undulating, and rises on the western boundary into two ranges, part of the Green Mountains, one of which—the Hoosac range—separates the Connecticut River from the Housatonic Valley, and the Merrimac, which flows 35 miles N.E., while the Taconic range, on the west of the Housatonic Valley, rises in the Saddleback to a height of 3,505 feet. The heights are generally well-wooded, and there are in the state nearly half a million acres of wood. While the east is rocky and sterile, along the river valleys and elsewhere the soil is fertile, and agriculture is advanced, though the importance of the manufactures now throws the agriculture into the shade. Granite, sandstone, and marble, are quarried. The rivers give plenty of water-power, and there is much manufacture of cotton, woollens, worsted, boots, shoes, leather, iron, etc. Boston, the great literary centre of the United States, is the sea-port and capital, and there are many other important towns, some of which have specialised industries. At Cambridge is the celebrated Harvard University, and education generally is well advanced in the state. Northmen are said to have founded a colony here, but it was in 1620 that the Pilgrim Fathers landed at Plymouth in the *Mayflower*, and in 1692 that this settlement united with another, formed by Endicott and his Puritans at Salem in 1628, and that the two became one colony, which retained much of its Puritan character till the 19th century was well advanced. It was in this state that the Revolution began which separated the States from the mother country.

Massage, a system of treatment which consists in the mechanical manipulation by stroking, rubbing, kneading, etc., of the various parts of the body, with a view to improving muscular nutrition, aiding the removal of waste products from the tissues, promoting the circulation of the blood, and the like. Massage has been employed with benefit in certain forms of paralysis, in joint affections, sciatica, in dropsical effusions, and for the relief of certain conditions of the stomach (dyspepsia, dilatation of the stomach, etc.), as also in neuralgia, insomnia, and hysteria.

Massena, ANDRE (1758-1817), a celebrated French general, was born of Jewish parentage at Nice, and served for four years in the Sardinian army. In 1792 he joined the French army as a volunteer, and the next year was elected colonel, and made general of division. He won many victories in Italy, the principal being that of Loano (1795), and then went to Switzerland, where he performed many brilliant exploits. He returned to Paris, and was a member of the Corps Législatif in 1803, Marshal in 1804, when he received the Grand Eagle of the Legion. Napoleon sent him to Italy to put Joseph on the Neapolitan throne, and he then joined Napoleon in Poland, where his services

gained for him the Dukedom of Rivoli, and after Eckmühl and Wagram he was made Prince of Essling. He was then sent to Spain, where his genius had to give way before that of Wellington, though Massena himself held that his disasters were brought about by the disobedience of Ney and others. After this campaign he was practically relegated to obscurity.

Massenet, JULES (b. 1842), a French composer, was born near St. Étienne, and studied under Ambrose Thomas at the Conservatoire of Paris. In 1863 he won the Prix de Rome, and soon established his fame as a successful composer. Among his best known works are the operas *Don César de Bazan*, *Manon Lescaut*, *Roi de Lahore*, and the oratorios *Marie Madeleine* and *Ève*. Massenet was appointed professor of composition at the Academy in 1878.

Massillon, JEAN BAPTISTE (1663-1742), a great French preacher, was born at Hyères. In 1681 he entered the Oratory, and achieved success as a preacher. He entered, however, a more severe order, only to be brought back to the Oratory by Cardinal de Noailles. He came to Paris, and preached before the Court in 1699. It was not, however, till 1717, under the regency, that his abilities were rewarded by the see of Clermont. In 1719 he was elected to the Academy, and for a time he preached regularly at Court. In 1723 he preached for the last time in Paris, and then spent 20 years in his diocese.

Massinger, PHILIP (1584-1640), an English dramatist, was at Oxford from 1602 to 1606; but there is little knowledge of his life, and most statements about him are conjecture. In 1621 his first play was produced at Court. From the character of his *Virgin Martyr* (1620), which deals with the story of St. Dorothea and resembles one of the old miracle-plays, the *Renegado*, the hero of which is a Jesuit priest, and the *Maid of Honour*, it has been thought that he was a Catholic, but nothing is known for a certainty upon this head. Of his many plays 19 only are extant. Of these one of the best known is *A New Way to Pay Old Debts* (1633). Others are a *Roman Actor*, which was his favourite among his productions, the *Bondman*, the *Duke of Milan*, and the *Grand Duke of Florence*.

Masson, DAVID (1822-1907), was born at Aberdeen; educated at Aberdeen and Manchester. At 19 he became editor of a provincial paper, and afterwards a member of the staff of W. and R. Chambers. In 1847 he came to London, and wrote for the *Encyclopædia Britannica* and the *English Encyclopædia*. In 1852 he became Professor of English Literature at University College, London, and in 1865 Professor of Rhetoric and English Literature at Edinburgh, a post which he resigned in 1896. From 1859 to 1868 he was editor of *Macmillan's Magazine*. Among his best-known works are *Essays* (1856), his *Life of Milton*, six volumes, his edition of Milton (1874), and his *De Quincey* (1878), written for the *English Men of Letters* series.

Massorah, MASORA(H), MAS(S)ORETH, the "tradition," or body of traditional and authorita-

tive comments on the text of the Old Testament, often in the form of marginal notes embodying various readings, grammatical comments, and interpretations. There are two versions, of which the Eastern or Babylonian is more important than the Western or Palestinian. They comprise the notes of a long series of Jewish scholars, and established the system of Hebrew vowel points.

Massowah, a town on a coral island off the W. coast of the Red Sea, lat. 15° 36' N. and long. 39° 28' W. The town is in the W. of the island, which is only half a mile long, and is connected by a causeway, 1,610 yards long. The climate is hot and unhealthy, but Massowah is next to Suakim in importance as a Red Sea trading-place. The chief industries are the gathering of pearls and mother-of-pearl, some weaving, and fishing, and the exports are pearl, mother-of-pearl, skins, gums, ivory, wax, and gold. The island was given by Turkey to Egypt in 1866, and was occupied by Italy in 1885. The natives are of the Ethiopian race.

Master, a name sometimes given to the head of a College at the Universities. In the navy, a rank now disused. Previous, however, to 1866, the master was an officer ranking immediately below lieutenant. In that year masters were given the title of navigating-lieutenants. At present the class of navigating-lieutenants is undergoing gradual abolition, and ordinary lieutenants are assigned to specially undertake the navigation of ships.

Master and Servant, the relationship arising out of the contract of hiring. Such contract may either be for an expressly definite period or for an indefinite or unexpressed period, but a general hiring, in the absence of any custom to the contrary, is presumed to be a yearly hiring, and in all cases a hiring at so much per month is hiring for a year. With regard to domestic servants, such hiring may be determined by a month's notice or a month's wages in advance, given or paid at any time; but in the case of clerks and superior servants the hiring, if general, is construed to be a hiring for one year, and so on from year to year, and must be determined with the year, at least in the absence of misconduct. Every person suffering himself to be hired as a skilled artisan warrants that he possesses the requisite ability and sufficiency, and upon proof of his want of such ability or sufficiency, i.e. his incompetency, his employer may discharge him. The not providing with food, etc., or ill-treatment of a servant by his master, is an indictable offence, and punishable, on summary conviction, by a fine of £20 or six months' imprisonment, with or without hard labour, under the Conspiracy and Protection of Property Act, 1875, which repealed many earlier Acts and provides that in trade disputes no agreement or combination shall be indictable, unless the act contemplated would be indictable if done by one person, while it also makes special criminal provisions in the case of persons employed by gas and water companies. It imposes penalties on masters for not taking proper care of their servants, and on persons intimidating or using threats or

violence to others, and provides for a summary process in such cases, with an appeal to Quarter Sessions. By statutes passed in the reigns of George IV. and of Victoria, provision is made for arbitration between workmen and their employers in trade disputes, and by the Employers and Workmen Act, 1876, special powers are conferred on County Courts as to obtaining payment of money set off and rescission of contracts, and taking security for performance of contracts in trade disputes; and the same jurisdiction is given to justices up to the value of £10. By the Workmen's Compensation Act, 1906, workmen and domestic servants are entitled to compensation for accidents occurring in the course of their employment.

Master of Arts, usually abbreviated to M.A., an academical degree following that of Bachelor of Arts (B.A.).

Mastic, the resinous exudation of the bark of *Pistacia Lentiscus*, an evergreen shrub belonging to the terebinth family and native to the Mediterranean region. It is mainly collected in the island of Scio, of which it forms the chief source of revenue. It is obtained from artificial incisions between June and September, one tree yielding 8 or 10 lbs. a year. From 200 to 250 tons are extracted annually, the best going to Constantinople, Trieste, and Marseilles. It is soluble in turpentine or ether, but only partly so in cold alcohol, and is used by dentists and varnish-makers. *East Indian* or *Bombay mastic* is the product of *P. Khinjuk* and *P. cabulica* in Sindh, Afghanistan, and Baluchistan; and *P. atlantica* yields a similar resin, which is chewed by the Arabs of Algeria. *Cape mastic*, used in South Africa, is obtained from *Euryops multifidus*, one of the Compositæ.

Mastiff, a name for a European and an Asiatic breed of dogs of large size and noble appearance. The origin of the English mastiff is lost in obscurity. The original breed has been much modified by crossing with the St. Bernard, the boarhound, and the bull-dog. The average height of the English mastiff at the shoulder is from 28 to 30 inches, and the chest girth should be at least a third as much. The body is long and cylindrical, with a smooth coat, the limbs stout and strong, the feet round and close, and the tail thick, but not bushy. The ears and lips are pendulous, and dogs are now bred with the head much shorter, the muzzle more nearly square than was the fashion some years ago. The general colour is fawn, with dark or black muzzle, ears, and feet. Dogs of the old breed were fierce and courageous; the mastiffs of the present day are kept as companions and watch-dogs. The Tibet Mastiff is a little smaller, and has a rough coat.

Mastigophora, a primary group of Infusoria (also known as FLAGELLATA). They are distinguished by the flagellum from the Ciliata, Acinetæ, and Tentaculifera.

Mastodon, a genus of fossil Proboscidea, closely related to the elephants, from which they differ only in their teeth. They had two incisors or tusks in the upper jaw, but slightly curved, and

sometimes furnished with longitudinal bands of enamel on their surface. There were sometimes also a pair in the lower jaw. The molar teeth had fewer ridges than those of elephants, scarcely any cement between them, and conical cusps, whence the name (from the Greek *mastos*, "nipple"; *odous*, "tooth") is derived. Mastodon occurs in the Miocene and Pliocene rocks of the Old World, two species occurring in the English Crag; but in North America they survived into Pleistocene times. Their remains have been found in India, in the Andes, and perhaps in Australia.

Masts, the nearly perpendicular timbers, or steel tubes, to which are attached the rigging, yards, and sails of a ship. A mast is either of one piece, in which case it is a "pole-mast," or it is composed of several sections, each of which also retains for itself the name of mast, and each of which, if large, may, in turn, be built up of several timbers. When a vessel has two masts, the foremost is the foremast, and the aftermost the main. Where there are three, the foremost is the foremast, the middle is the main, and the aftermost is the mizen. Each of these masts may consist of as many as four principal sections raised one above the other, and known, respectively, as the lower mast, the top-mast, the topgallant mast, and (though this is a rare addition) the topgallant-royal mast. Extra masts aft of the mizen are termed jiggers or spankers. Lower masts are now very generally made of iron or steel. In days when ships depended exclusively, or even chiefly, on sail power, the dimensions of masts were generally larger than at present.

Masulipatam, a town and seaport of the Kistna district, in the Madras Presidency, India, 215 miles N. of Madras. Once it was renowned for its chintzes on account of the brilliance and permanency of the dyes, and some weaving and printing is still carried on. It is an important missionary station. An agency was established in 1611, and a fort in 1622. In 1864 a storm wave caused much damage and the loss of 30,000 lives.

Matabililand is a district lying N. of the Transvaal and between the Zambesi and the Limpopo, having a length of 180 miles and a breadth of 150 miles. The *Matabili* (Amandebeli) are a mixed Zulu people, who under their chief, the fugitive *induna* (captain) Umsilikatze, first settled about 1828 in the Marico district, on the borders of the present Transvaal and Bechuanaland. Driven thence in 1837 by the Boers, Umsilikatze led a motley gathering of Zulus and Bechuanas across the Limpopo, and established himself at Bulawayo in the Matoppo Hills, where he introduced the Zulu military system and founded the present kingdom of Matabililand. The occupation of the country was thus from the first of a purely military character, and the royal kraal at Bulawayo was in the nature of a hostile camp planted in the midst of the peaceful and industrious aborigines—Mashonas, Makalakas, and Banyai—against whom were organised periodical plundering expeditions, which almost threatened them with extinction. After an interregnum of two years following

the death of Umsilikatze in 1868, his second son, Lobengula ("The Defender"), was chosen by the indunas as his successor, although the eldest son, Kuruman, was still living. Lobengula continued the old system in its full rigour. But he was induced in 1892 to come to terms with the British South Africa Company, surrendering in their favour his pretensions to Mashonaland, and allowing them to peacefully occupy that country. [MASHONAS.] This arrangement, however, was viewed with disfavour by the more warlike indunas and *impis* (armed and disciplined bands), which had hitherto lived by rapine and murder, and they forced Lobengula to break his engagements with the company, to renew the periodical marauding expeditions into Mashonaland. After a brief but sanguinary war, Lobengula was killed, and the subordinate chiefs submitted. In 1896 another revolt broke out, but after a few months it was suppressed. Although claiming to be full-blood Zulus, the Matabili are a mixed people, forming, according to their diverse origin, three distinct classes: (1) *Abasanz*i, descendants of the original Zulu tribe led into the Transvaal by Umsilikatze; (2) *Abentla*, descendants of the Bechuana captives incorporated in the Marico district; (3) *Amaholi*, descendants of the Mashona, Makalaka, and other captives incorporated in Matabililand. These heterogeneous elements are reflected in the mixed character of the language (*Insidebeli*), which is a degraded or simplified Zulu dialect, full of numerous words and expressions borrowed from the various subject peoples. Under the administration of the Chartered Company, the Matabili are settling down. Total population in 1908 was estimated at 221,000.

Matador. The man appointed in bullfights (q.v.) to administer the fatal stroke to the bull, when excited by the *picadores* and *banderilleros*. He is armed with a sword and small red flag. The sword is plunged into the bull near the left shoulder blade; a skilful matador can kill with one thrust.

Matafunda. An ancient military engine which threw stones by means of a sling.

Matagasse. A name given to the great grey shrike, or European butcher bird, *Larnis excubitor*.

Matamata. The native name of the *Chelys fimbriata*, a tortoise found in Brazilian rivers. It lives on fish and small water-birds; its body is fimbriated in a curious manner.

Matanzas. (1) A province in Cuba, bounded on N. by Florida Channel. Area, 3,700 square miles; population, 239,000. Produces tobacco and sugar. (2) A city and seaport in the above province, 55 miles E. of Havana, with which it is connected by rail. It is well-built, and has a good harbour sheltered from most winds. There are distilleries and iron-foundries, and sugar, rum, molasses, and cigars are exported. Population, 36,000.

Matches. The most primitive mode of obtaining fire, and that still practised by many savage

tribes, was by the rubbing together of pieces of wood. The next step was the use of pyrites and steel, by the striking of which sparks were obtained, which set alight pieces of dried cloth or other combustible material—the tinder. The first matches consisted of sulphur-tipped pieces of wood, which were set alight by the ignited tinder. At about the beginning of the 19th century a form of match was invented consisting of a wood splint, the end of which was coated with sulphur, sugar, and potassium chlorate, and which was ignited by dipping into a bottle containing asbestos soaked in strong sulphuric acid. This method presented obvious objections, and many other devices appear to have been tried and some forms of friction matches invented. None, however, met with any success, until a friction match known as the Congreve was brought out. Congreve matches consisted of wood splints dipped in molten sulphur, and tipped with a mixture of potassium chlorate and sulphide of antimony. These were ignited by drawing between pieces of sand-paper. Various improvements soon followed, and in 1833 phosphorus was used to replace the antimony sulphide, and matches almost like those in present usage were produced in various localities. The use of paraffin instead of sulphur for the dipping the splints did away with the noxious fumes and was commonly adopted; sulphur is, however, largely employed for cheap Continental matches. In the manufacture, on a larger scale, many practical difficulties had to be overcome, and much mechanical ingenuity has been spent in perfecting machines for cutting and shaping the wood, etc. The wood is first cut into circular blocks, and then turned upon a form of lathe, where a suitably-arranged cutter strips off a continuous strip of wood of the thickness of a single match. These strips are cut into single splints, dried, and then by ingeniously-conceived mechanism dipped into (1) melted paraffin, (2) the mixture that forms the head. They are then carefully dried and boxed. The igniting mixtures usually consist of potassium chlorate, or nitre and phosphorus, coloured with some pigment as red-lead, umber, etc., and made into a paste with gum. Safety matches were first invented by Bryant and May in 1855, and differ from the ordinary kind as they contain no phosphorus in the head of the match, which is composed of potassium chlorate, potassium bichromate, red-lead, and sulphide of antimony. The rubbing surface is coated with the non-poisonous amorphous or red phosphorus, and for ignition the matches must be rubbed upon this surface only. Cotton dipped in melted paraffin and wax is also employed in place of wood splints for the wax vestas largely used by smokers. Fusee matches, vesuvians, etc., consist of matches with large heads composed of some porous material, as bibulous paper, charcoal, etc., saturated with nitre solution, dried, and tipped with the ordinary igniting mixture. In America the manufacture is subject to a tax, and is an important source of revenue. In France it is carried on as a Government monopoly. In Germany it is well established amongst a large number of firms. In England two firms produce almost all the matches employed.

i.e. Bryant and May, London, and Bell and Black, Glasgow. Of late years the manufacture has been increasing very largely in Norway and Sweden, the Swedish matches being very extensively employed.

Mate, an old naval rank equivalent to the modern one of sub-lieutenant, in favour of which it was abolished in 1861. "Mate" in the navy now means "assistant," and is applied to various petty officers, as, for example, boatswain's mate, carpenter's mate. "Signal mate" is still the colloquial name for the sub-lieutenant to whom the management of a ship's signals is assigned. In the mercantile marine "mate" is the title of any officer who performs such duties as in a man-of-war would be performed by a lieutenant.

Maté, or PARAGUAY TEA, the dried leaves of *Ilex paraguayensis* and allied species of holly growing in Paraguay and south Brazil, furnishes the chief non-alcoholic drink of South America. Though used immemorially by the Indians, the tree was first cultivated by the Jesuits. The dried leaves are packed in *serons* or raw hides containing about 200 lbs. each. The infusion is prepared in a calabash or *maté*, usually silver-mounted, boiling-water and sugar, with milk or lemon-juice, being added to the leaves (*yerba*), and the beverage taken very hot through a metal or reed tube or *bombilla* with a strainer at one end. Maté contains 1.85 per cent. of caffeine, acting as a restorative, much as tea does; but, being bitter, the taste for it has to be acquired.

Materialism, the denial of the existence of any substance except matter, and of any force except what is derived from the eternal properties of matter and from the motions of material bodies, molecules, or atoms. This doctrine involves the negation of the ideas of "soul" and "spirit" and of "deity" (except on a pantheistic hypothesis), and the explanation of mental phenomena in terms of chemical and mechanical change. One of the earliest materialists of western antiquity was Thales of Miletus, while Leucippus, Democritus, and Epicurus taught divers forms of atomic materialism; but these ancient philosophers did not entirely reject the gods of Greek mythology.

Materia Medica is the science which deals with the materials used in medical treatment, their names, source of origin and composition, the preparations which are made from them, their properties, actions and doses. PHARMACOPŒIA, and various articles: LINIMENTS, TINCTURES, ETC.; APERIENTS, DIURETICS, ETC.]

Mathematics is the science of number. Any quantity requires for its complete expression a representation of its magnitude; if it only requires this, it is termed a number, and the study of such representation is termed *notation*. Most quantities occurring in nature are, however, more complex; not only do they require magnitude, but also a knowledge of the standard of comparison. A simple length, for instance, requires a number and a unit, as three feet, thirty-six inches, or one yard. Here the same physical quantity is represented by entirely different numbers—3, 36, and 1 respectively

—there being in each case different standards of comparison—viz. the foot, the inch, and the yard. The correct distinction may at once be inferred between pure and applied mathematics. The former studies pure number and the relations between numbers; the latter involves the use of various units or standards of comparison. But, on the other hand, the study of pure number is in many cases simplified by attaching meanings to the quantities involved, beyond what they actually hold. The product of two numbers, for example, is often more clearly understood when the numbers themselves are assumed to represent lengths, and their product an area. On this account, pure mathematics deals with elementary units to an indefinite extent, and applied mathematics is made to cover chiefly those branches of the science that involve more intricate units, such as those of force or energy. Numbers are conveniently represented by lines, and investigation by such graphical means is the principle of *geometry*. This branch may involve a study of space-relationships that are apparently independent of magnitude, but even in such cases there is a connection, though its nature may be so intricate as to remain unexplained. When numbers are represented for brevity by symbols, such as letters of the alphabet, combined with other symbols, denoting operations performed on these numbers, such as raising to given powers, or the extracting of given roots, we enter the domain of *algebra*. The properties of points, lines, areas, and volumes in space may be investigated entirely by means of their position and magnitude, without the use of notation system; this is *pure geometry*. Or they may be investigated with the aid of ordinary numbers, or symbols representing ordinary numbers; this is *analytical geometry*. These properties are specially studied in the case of triangles and polygons in connection with angular measurement, and lead to *trigonometry*, *plane*, in the case of figures lying in one plane, *spherical* in the case of curvilinear figures that lie on the surfaces of spheres. The infinitesimal calculus deals with small increments in variable quantities, and must be regarded solely as a method, though an exceedingly powerful one, for prosecuting algebraic research; its two chief branches, the differential and the integral calculus, are converse in their nature, as multiplication and division, though it is nearer to the truth to define their difference as being that between analysis and synthesis. Applied mathematics is many-headed; all branches of natural philosophy require applications of mathematics, and an advance of knowledge in any branch may be often initiated by purely mathematical reasoning. The most direct applications are to the study of force in dynamics, while this subject again is continually introduced in physical questions, such as those on light, heat, magnetism, electricity, chemistry, or astronomy; but the connection between these sciences is too intimate to allow us to further subdivide the subject of applied mathematics.

Mather, the name of a celebrated New England family which for four generations exercised great

influence in the colony. RICHARD was born in Lancashire, educated at Oxford, and went to New England in 1635. INCREASE (1638-1723), son of Richard, was educated at Harvard, and visited England. He came to Boston, where he was pastor and president of the college, and represented the colony to the English Government. He wrote many books and tracts. COTTON (1663-1728) graduated as B.A. at Harvard in 1678. His father had married a Miss Cotton, and the son bore the two names which were almost equally honoured in the colony. For forty-three years he occupied the pulpit, having many good qualities, and some defects. He was energetic, ascetic, philanthropic, courageous, and learned, but at the same time ambitious, obstinate, irritable, superstitious, and wanting in tact.

Mathew, THEOBALD, FATHER (1790-1856), the "Apostle of Temperance," was born in Tipperary and educated at Kilkenny and Maynooth. From 1808-14 he lived at Dublin, where he was ordained priest, and joined the Capuchin Order. He went then on a mission to Cork. In 1848 he founded the Total Abstinence Association, and the enthusiasm he created caused the movement to spread like wildfire. In 1844 he visited Liverpool, Manchester, and London. His labours and travels involved him in debt, but in 1847 he received a pension of £300. The year 1850 he spent in the United States.

Mathews, CHARLES (1776-1835), English comedian, was born in London and educated at Merchant Taylors'. In 1794 he obtained an engagement at the Dublin theatre, and in 1802 he came to the Haymarket, where he proved a great success. His great power lay in his mimicry and in his variety of facial expression. In 1818 he began his "At Homes" at the Lyceum, and these also met with much success. He was of amiable character, and much liked in private life.

Mathews, CHARLES JAMES (1803-78), son of the above, and also light comedian, was born at Liverpool, and educated at Merchant Taylors'. He first appeared at the Adelphi, and afterwards managed the Olympic, Covent Garden, and Lyceum theatres. Many will remember him in *Cool as a Cucumber*, *Patter and Clatter*, *Little Toddlekins*, and *My Amfud Dad*.

Matilda (English, "Maud") (1103-67), daughter of Henry I. of England, married (1115) the Emperor Henry V., and fourteen years later Geoffrey, Count of Anjou, by whom she became the mother of Henry II., whose rights during his minority she stoutly upheld against Stephen, being aided in this by her half-brother Robert of Gloucester. A compromise at last settled the dispute between them. MATILDA was also the name of the wife of William the Conqueror, chiefly remembered for the Bayeux Tapestry and the church she founded at Bayeux.

Matilda, COUNTESS OF TUSCANY, "the Great Countess" (1046-1114), succeeded the duke her father. She was the aunt by marriage of Godfrey of Bouillon, and was renowned for her determined championship of Gregory VII. and the Papal cause during the Great Schism,

in spite of the formidable powers that took part with the anti-Popes. It was at her castle of Canossa that the Emperor Henry IV. had to humiliate himself to the Pope. In 1102 she gave all her possessions to the Church, thus laying the foundation of the Papal States. She was twice married, and was buried in the Vatican.

Matlock, on the Derwent, and the Midland Railway, a watering-place in Derbyshire, 17 miles N.W. of Derby. It consists of four towns—Matlock town, Matlock Bank, Matlock Bath, and Matlock Bridge. At Matlock Bath are three hot springs of great therapeutic reputation. Among the show-sights are the High Tor (400 feet), the Heights of Abraham (1,100 feet), the stalactite caverns, and the petrifying wells. There are cotton, corn, and paper mills, and a good deal of spar is worked into ornaments. Pop. (1901) of Matlock town, 5,980; of Matlock Bath and Scarthin Nick, 1,816.

Matsys, QUENTIN (1466-1531), a Flemish painter, was born at Louvain. Tradition makes him a blacksmith who turned painter, and attributes to him the ornamental iron-work over a well near the door of Antwerp cathedral. At any rate, he came to Antwerp in 1491, and forms a connecting-link between the old and newer schools of Netherland painters. His *Virgin and Child with the Marys* was painted for Louvain, and others of his works are the *Burial of Christ*, together with the *Martyrdom of St. John the Evangelist* and *St. John the Baptist*, and two other *Madonnas*, *The Money-Changers*, and *The Gaolers*.

Matter. In *philosophy* (Aristotle's *hyle*), that which is in itself not definite, but by receiving a form becomes a substance. In *physics*, it has been urged that only two kinds of things are known to exist in the physical world; of these one is matter, and the other energy. Both are indestructible; by no conceivable process can the quantity of matter in the universe be increased or diminished by a single ounce, and this property is known as the conservation of matter. Matter is characterised by its inertia; it always tends to remain in the same state, either of rest or of uniform motion in a straight line, unless some force compels it to change that state. This was enunciated by Newton, and is known as his first law of motion. The most popular idea of matter is that it is something which has size, which can occupy space; and regarding the ultimate structure of matter many hypotheses have been propounded. The Greek philosophers more than 2,000 years ago conceived that matter could be subdivided into particles smaller and smaller until an indivisible *atom* was reached. That these atoms were hard, with space between them, was accepted by Newton; while Bosovich eliminated the material property of the atom altogether, and considered it to be no more than a mathematical point acted on by forces. This theory was not accepted for long, since it was unable to account for the property of inertia. Another theory assumed matter to be continuous—not separated into distinct particles. The most modern theory, propounded by Sir W. Thomson and investigated by Helmholtz, imagines matter to

be merely the rotating parts—vortex atoms—of some fluid which possesses inertia and entirely fills space; this vortex theory is, however, still in its infancy. Some properties of matter are familiar to all, such as its weight, divisibility, cohesion, plasticity, ductility, viscosity, rigidity, elasticity, transparency, colour, capillarity, etc.

Matterhorn. THE (French, *Mont Cervin*; Italian, *Monte Silvio*), an Alpine peak between Piedmont and the canton of Valais, 14,700 feet high. It was climbed for the first time in 1865 by Mr. Whymper, Lord F. Douglas, Rev. C. Hudson, and Mr. Hadow. The last three, with one of the guides, fell over a precipice and were killed.

Matthew, St., one of the twelve apostles, and the reputed author of the Gospel that bears his name, was a Hebrew tax-gatherer, and seems to have been a man of some position. We read of his giving a feast and being in the upper room where Matthias was chosen in the place of Judas. According to Eusebius, he spent his later years at Jerusalem teaching the Jews, and in going on foreign missions, one being to Ethiopia. Some authorities say that he died a natural death, others that he was martyred.

Matthias Corvinus (1443–90), King of Hungary, was born in Transylvania, being the younger son of John Hunyadi, who died in 1456, after being governor of Hungary 1446–53. On John's death, his eldest son, Ladislaus, was executed by Ladislaus, King of Hungary and Bohemia, and Matthias was imprisoned at Prague. In 1458 Matthias was elected to the throne, but was not crowned till six years later. He drove out the Turks, fought with the king of Bohemia, quelled the insubordination of his own magnates, and fought with Frederick III. and took Vienna, which he made his capital. He was an ambitious man, and bent on conquest, but was a great patron of arts and letters, and founded an university, observatory, and library. His rule was arbitrary, and his wars caused him to tax his people heavily.

Matto Grosso, an inland province of Brazil bordering on Bolivia. Although it has an area of over 32,000 square miles, it is thinly inhabited, chiefly by Indians and negroes. The rivers Madeira (q.v.) and Paraguay rise here, and vegetation is abundant along the rivers, though sparse upon the plateaus. The chief industries are agricultural pursuits and cattle-rearing. Formerly the district produced gold and diamonds. Capital, Guyabã.

Mauchamp Sheep, a breed of merino sheep remarkable for long, smooth, straight silky wool. They are descended from a merino ram-lamb born on the farm of Mauchamp, near Berry-an-Lac, in the department of the Aisne, France.

Maulmain, a town of Tenasserin, in Burmah, near the mouth of the Salween, formerly (when ceded in 1826) only a waste, but now second only to Rangoon in importance. A range of hills rising behind the town affords a pleasant place of residence, with a fine view. The inhabitants are chiefly Buddhists, Hindus, and Mussulmans. There is some ship-building, and teak, copper, lac, horns, hides, rice, and lead are exported.

Maundy Thursday, the Thursday in Holy Week or before Easter Day, so named from the "mandate" (recorded John xiii. 24) given by Jesus Christ before He washed His disciples' feet, which ceremony is still commemorated in the Latin Church. On this day also the royal bounty of Maundy money is distributed by the Lord High Almoner of British sovereigns in the Chapel Royal, Whitehall. The day is called *Chare* or *Shere* and *Cæna Domini* ("the Lord's Supper").

Maupassant, GUY DE (1850–93), a French author, was born in Normandy. He fought in the Franco-German War, and then fell under the influence of Flaubert. As a writer he belongs to the naturalistic school. He wrote a play, some lyrics, and many novels, some of the latter being *La Maison Tellier*, *Contes et Nouvelles*, *Pierre et Jean*, and *Fort comme la Mort*. Towards the end of his life his mind gave way.

Maupertuis, PETER LOUIS MOREAU DE (1698–1759), mathematician and astronomer, was born at St. Malo. For some years he was a soldier, but love for mathematics caused his retirement. In 1723 he became a member of the Academy of Sciences, in 1728 he visited London and was made F.R.S., and in 1736 he was sent to Lapland to measure the meridian in the arctic circle. He spent much time at Berlin, where he married, and died at Basel. He wrote many works on astronomy, *The Laws of Motion*, *The Laws of Rest*, and *Essay on Cosmology*.

Maurice, FREDERICK DENISON (1805–72), author and theologian, was the son of an Unitarian minister. He went to Trinity College, Cambridge, migrating later to Trinity Hall, where he obtained a first class in Civil Law (1827), but could not take his degree owing to his religious views. He then went to London, and became editor of the *Athenæum*, and, falling under Coleridge's influence, he joined the English Church, and became a typical Broad Churchman, though he disliked all party names. Having gone to Oxford and graduated there, he took orders in 1834, and after some experience of parish work, was appointed chaplain to Guy's Hospital, where his sermons attracted many to the chapel. In 1840 he became professor of literature and history at King's College, and of divinity in 1846, but his *Theological Essays* (1853) offended the authorities and caused him to lose his professorships. From 1846–60 he was chaplain of Lincoln's Inn, and from 1860–69 incumbent of St. Peter's, Vere Street. His congregations were composed of a select body of thinkers on whom and through whom he exercised a deep influence. His views upon co-operation and Christian Socialism caused him to be looked on as the workman's friend, and he had much to do with founding the Working Men's College, and Queen's College for Women. In 1866 he became professor of Moral Philosophy at Cambridge. He wrote a novel, *Eustace Conway*.

Maurice, PRINCE OF ORANGE (1567–1625), son of William the Silent, was born at Dillenburg. After his father's death he was elected Stadtholder and, with the aid of the English expedition under

Leicester and Sir Philip Sidney, he beat Spain and gradually won back the Low Countries, which became a free republic in 1609. His endeavours for the good of the country were much hampered by the struggles of parties at home.

Mauritania, the district N. of the Atlas Mountains, in Africa, now Morocco, was separated from Numidia by the Mulucha, though at a later period it went farther E. and stretched from Ampsaga to the Atlantic. It was part of the great granary of Rome, and supplied much timber, especially the renowned citrus.

Mauritius, an island in the S. of the Indian Ocean, 556 miles E. of Madagascar, and 940 S.E. of the Seychelles. It is an irregular triangle in shape, and is 36 miles long by 23 miles wide, and contains 713 square miles. The isle is surrounded by coral reefs, which make approach difficult. It is of volcanic formation, and there are lakes which are old craters, the chief of these being Grand Bassin in the S. The N. and N.E. are comparatively level, but the rest of the island is picturesquely hilly and mountainous, the heights varying from 500 to 2,700 feet. The Pouce (2,650 feet) and Pieter Botte (2,676 feet) are remarkable peaks. The rivers are small, and in the dry season mere brooks, the longest (10 miles) being the Grande Rivière. The climate is pleasant during the cool season, but very hot at other times, and hurricanes are frequent. The soil is fertile; but, owing to its stoniness, cultivation has to be carried on with the hoe. Most necessities of life are imported, and the exports are sugar, rum, vanilla and fibre. Port Louis, in the N.W., is the capital and the seat of government. Most of the officials live in the hills, especially at Curepipe (1,800 feet), where, as at Port Louis, there is a small garrison. There are some railways and fair roads, and good schools. Port Louis has a Roman Catholic bishop, and there is a Protestant bishop of Mauritius. England took Mauritius from France owing to the damage done to our trade by cruisers which sheltered there.

Maurocordatos, the name of a Greek family which has had great influence on the history of their country. ALEXANDER (1637-1709) studied medicine in Italy, and in 1681 became interpreter to the Porte, and had great influence in the Turkish Empire. NICHOLAS, son of above, was Hospodar of Wallachia and Moldavia. CONSTANT, son of above, was Hospodar of Moldavia, and abolished serfdom. ALEXANDER (1791-1865) was born in Constantinople, and played a great part in the Greek struggle for independence. He prepared the Declaration of Independence, and drew up the plan of government, and became President of the Executive Body. In 1822 he saved the Peloponnesus. He was a good worker, and a patriot, but was unpopular through his liking for England and his dislike of Russia. Under King Otho he was minister and ambassador, and was for a time Prime Minister at the beginning of the Crimean War.

Maury, JEAN SIFFREIN (1746-1817), French Cardinal and Archbishop of Paris, and opponent of Mirabeau, whose rival he was in eloquence. He

took orders at Avignon, and came into notice through an *éloge* on Fénelon. In 1772 he published an *Essai sur l'Éloquence de la Chaire* and later *Principes d'Éloge*. In 1781 he was appointed court preacher, and in 1785 was elected to the Academy. In 1792 he became an *émigré*, and went to Rome, where he was looked on as a martyr and was created Cardinal. He afterwards courted Napoleon, and was made Archbishop of Paris, but at the Bourbon restoration was sent to Rome, and was imprisoned in St. Angelo.

Maury, MATTHEW FONTAINE (1806-73), was born in Virginia, and in 1825 became a midshipman, and took part in a four years' voyage of exploration. In 1836 as lieutenant he took part in another exploring expedition. In 1839 an accident lamed him, and he was appointed to superintend the dépôts of charts and instruments. His special study was the laws of winds and currents, and he made a great collection of specially-arranged log-books embodying observations on points which he had brought to the notice of captains. We may trace to the initiative of his efforts the establishment of our own Meteorological Office. His Southern sympathies in the War of Secession brought him troubles, but he eventually returned to Virginia. His first published work was a *Treatise on Navigation* (1848), but his most widely-known work is the *Physical Geography of the Sea* (1855).

Mausoleum, a large, fine sepulchral monument or an edifice built as a burial-place for one person—like the original mausoleum erected at Halicarnassus in Caria, Asia Minor, by Queen Artemisia in the 4th century B.C. as the tomb of her husband, King Mausolus—or for a family, or for the successive holders of some dignified office.

Mauveine, an aniline dyestuff, interesting chiefly as being the first of these substances prepared and used commercially. It was produced by Perkin in 1856 by the action of sulphuric acid and potassium bichromate on aniline.

Maviti (MAZITU), Zulu hordes, which about the middle of the 19th century crossed the Zambesi and overran the regions between the east coast and Lakes Nyassa and Tanganyika. Later some passed west of Nyassa, while others settled in small groups amongst the Mahenges of the Upper Lufiji and elsewhere. "From the head of Lake Tanganyika to the Zambesi, and from the lakes to the coast, the very name of the Maviti, Mazitu, Matuta—for they are known by these and other names in various districts—causes the native tribes to shudder." (E. D. Young, *Nyassa*, p. 178.)

Maxim Gun, an automatic machine- or quick-firing gun invented by Sir Hiram S. Maxim about 1883, and since adopted by most Governments. Its distinctive feature consists in the utilisation of the recoil caused by each discharge in order to extract the empty cartridge from, and reload and fire, the gun. It is fed with ammunition from a belt or bandolier, which may be of any desired length; and the rate of fire is controllable, up to about 300 rounds a minute or more. There is only one barrel, which is prevented by a metal water-jacket from becoming

over-heated. The weight of a 1·5 in. 1-pr. gun of this kind is 364 lbs., of its mounting 336 lbs. The gun of rifle-calibre (·303 in. bore) weighs but 50 lbs.

Maximilian I. (1459–1519), Emperor of the Holy Roman Empire, was the son of the Emperor Frederick III., and by his marriage with Mary, daughter of Charles the Bold of Burgundy, became the master of vast possessions. In 1493 he succeeded to the empire. With a view to putting an end to the system of constant private war he decreed a perpetual peace, and created courts and circles, each commanded by a captain, to enforce the decree. He also formed a standing army, an improved artillery, and a system of police. Later he was induced to make an attempt to gain Milan and Naples, and a war with Switzerland in 1499 led to the Treaty of Basel, which well-nigh secured the independence of that country. Maximilian set the example, so well followed in after times, of increasing the Austrian dominions by judicious marriages.

Maximilian, FERDINAND (1832–67), Archduke of Austria and Emperor of Mexico, was born at Vienna, the brother of the Emperor Franz Joseph, and served for a time in the Austrian navy. In 1857 he married Charlotte, daughter of Leopold I., King of the Belgians, and was appointed governor of Lombardy and Venetia. Two years after he retired into private life, from which he was called in 1863 to accept the crown of Mexico, a step which he took by the advice of Napoleon III. He landed at Vera Cruz in 1864, and it soon became apparent that he had greater difficulties to encounter than he had anticipated from the hostility of the population and the disfavour of the United States. In 1867 he was besieged in Queretaro, and, being captured, was tried by court-martial and shot. His fate rendered his wife insane. The discredit his failure brought on Napoleon III. was perhaps the beginning of the downfall of the Empire.

Max Müller, FRIEDRICH, philologist, was born in 1823 at Dessau, where his father was ducal librarian. Educated at Leipzig, where he graduated in 1843, he devoted himself to Sanskrit, and published the *Hitopadesa* in 1844. He then visited Berlin, Paris, and England in search of material, and was commissioned by the East India Company to bring out his edition of the *Rig Veda* (1847). In 1850 and 1854 he was appointed to chairs at Oxford, and in 1858 became fellow of All Souls' since when his life was chiefly identified with Oxford. Among his many works, perhaps the best-known are *Chips from a German Workshop* and the *Science of Language*. Other works are *Science of Religion* and *Natural Religion*. He died in 1900.

Maxwell, JAMES CLERK (1831–79), man of science, was born at Edinburgh, and educated at the Academy and university there. In 1850 he went to Cambridge, and came out as second wrangler and equal for Smith's prize in 1854. He was scholar and fellow of Trinity College. In 1856 he was made professor at Aberdeen, in 1860 at King's College, London, and in 1871 at Cambridge. His chief work is *Electricity and Magnetism*; but he wrote on the theory of heat, matter

and motion, equilibrium of elastic solids, theory of rolling curves, and many other points. He studied also the question of colours and colour-blindness, and made important additions to molecular physics.

Maxwell's Theory of light is that electromagnetic disturbances are propagated through space in waves of the same type as those of light. The theory is supported by dynamical considerations on the transmission of stress through the medium, and also by experiment. [ELECTRICITY, MAGNETISM.]

May, the name of the fifth month of the later Roman and British year—the month *Maius* of the old Roman year—sacred to Maia, mother of Mercury and goddess of Spring. In this month the sun leaves the sign of Taurus and enters that of Gemini.

May, THOMAS ERSKINE, SIR, BARON FARNBOROUGH (1815–86), was educated at Bedford, and became assistant librarian of the House of Commons, rising to the post of Clerk of the House in 1871. He was called to the Bar in 1838, was made K.C.B. in 1866, and retired with a peerage in 1886. His great work, *The Laws, Privileges, Proceedings, and Usages of Parliament* (1844), is of great value, and has been translated into several languages. He also wrote a *Constitutional History of England since the Accession of George III.* (three volumes, 1861–63, and a supplementary chapter in 1871); and *Democracy in Europe* (1877).

Maya, one of the civilised peoples of the New World, whose chief seat was in Yucatan, from them often called *Mayapan*; but the Maya race and culture were spread far beyond this region as far north as Tamaulipas and throughout Guatemala southwards to Honduras. In the 16th century the chief divisions were:—The *Yucatecs* or *Mayas proper* (Cocomes, Tutul-Xuis, Itzas, Cheles) of Yucatan; the *Chiapanecs*, *Lacandons*, *Tzendals*, and *Quelemes* in Chiapas; the *Quichés* dominant in the interior of Guatemala; the *Mams*, *Pokomans*, and *Cakchiquels* in south and south-east Guatemala and north Honduras; the *Huastecs* of Vera Cruz and Tamaulipas. These constitute the *Maya-Quiché* family, all of whom spoke closely allied dialects of the primitive Maya stock language, and most of whom still survive; for of all native races none have shown more vigour and tenacity than the Mayas in preserving their national characteristics, usages, traditions, and languages. In Yucatan they still form compact masses, little affected by Spanish influences, and on the east coast have to this day even succeeded in maintaining their political independence in a strip of territory extending from Cape Catoche to British Honduras. In the interior many of the whites have forgotten their mother-tongue, and even in the capital (Merida) Maya is universally spoken. Physically the Mayas are a fine race with thickset, bony frames, of mean height, light brown complexion, almost regular features, delicate hands and feet, round head, and remarkably intelligent expression. Their monuments are covered with inscriptions in a writing system, which was evidently greatly in advance of the Aztec, and which, although still undeciphered, seems to contain numerous purely

phonetic characters. The monuments themselves—such as the temples, palaces, pyramids of Palenque, Uxmal, Chichen-Itza—and the lately-discovered “Lorillard City,” present many curious architectural features, and are specially remarkable for their elaborate carvings, vast size, and massive character. Over sixty groups of ruins have already been surveyed, and many more undoubtedly lie still buried in the recesses of the forests, especially about the Guatemala and Chiapas frontiers. The great age formerly assigned to these ruins has not been confirmed by the observations of recent archæologists, and it now seems probable that most of the structures cannot have been erected many centuries before the arrival of the Spaniards. (Stephens, Catherwood, Charnay.)

Mayenne, a department, river, and town in N.W. France. The department, lying to the E. of Ile-et-Vilaine, is 51 miles long by 39 miles broad, and contains 1,996 square miles. Geologically it is connected with Brittany. Besides the Mayenne with its tributaries, the chief rivers are the Vilaine, flowing into the Atlantic, and the Sélune, flowing into the English Channel. The department has a varied surface, and is well-wooded. The chief productions are cattle, poultry, butter, game, honey, and cider. Among the chief industries are coal-mining, quarrying, spinning, and weaving. The river Mayenne flows with a course of 127 miles through the three principal towns, and joins the Sarthe at Angers. Mayenne, the town, is capital of Mayenne, and is an old town built upon high ground overlooking the river. The only buildings of note are the ancient castle (now used as a prison), and a 12th-century church. Most of the inhabitants are employed in the cloth manufacture.

Mayer, JULIUS ROBERT VON (1814–78), German philosopher, was born at Heilbronn. He studied medicine at Tübingen, Munich, and Paris, and, after some experience as a ship's surgeon, he settled down to practise in Heilbronn in 1841. In 1842 he published *The Mechanical Theory of Heat*, and in 1848 advocated the meteoric origin of the sun's heat. His writings have been collected.

May Flies, a family of *Neuroptera* (q.v.), known as the *Ephemeroidea*. They differ from other members of this order by the absence or imperfect development of the hind wings. Their development is somewhat abnormal, as the pupa gives rise to a “subimago,” which flies about for some time and then moults; after this it is in the form of the fully-matured adult or imago. This introduction of an extra-developmental stage is known as hypermetamorphosis. The larva lives for two or three years, but the mouth of the adult or imago is so imperfectly developed that it cannot take food, and therefore can only live for a day. Owing to this, they are often known as “Dayflies.” The larvæ breathe by “tracheal gills.” *Ephemera vulgata* (Linn.), which is used by anglers under the name of the Brown or Green Drake, is the best-known English species.

Mayhew, AUGUSTUS (1826–75), English author, wrote alone, and in conjunction with his brother (q.v.). **HENRY** (1812–87) ran away from West-

minster school, and, after a voyage to India, was articled as a solicitor to his father. With Gilbert à Beckett he started the *Cerberus*, and, being thwarted in this, he ran away with Gilbert to Edinburgh. In 1831 he started *Figaro in London*, and he wrote much with his brother, the results appearing as the work of the brothers Mayhew. *London Labour and the London Poor* was long quoted as a standard authority. He was the first editor of *Punch*, at whose birth he assisted. **HORACE** (1816–72), a brother of both the above, was a contributor to, and for a time sub-editor of, *Punch*.

Maynooth, a small town in county Kildare, Ireland, about 15 miles N.W. of Dublin on the river Ryewater. It contains the ruins of the castle of the Earls of Kildare and Carton, the modern residence of the Dukes of Leinster. Here in 1795 the Irish Parliament founded the Royal College of St. Patrick for the training of Roman Catholic priests. At the Union Government acknowledged its duty to this institution and passed an Act for its regulation, whilst in 1845 a grant of £30,000 for building and of £26,000 annually for maintenance was made by the Legislature. In 1871 the grant ceased in accordance with the Act for disestablishing the Irish Church, compensation being given. The building was seriously damaged by fire in 1878. It accommodates about 500 students.

Mayo, a county on the west coast of Ireland, in the province of Connaught, having the Atlantic to the N. and W., Sligo to the N.E., Roscommon to the E., and Galway to the S.E. and S. The area is about 2,060 square miles, the eastern portion of which is tolerably level, whilst the western half consists of granitic mountains, with a few fertile valleys running down to the sea. The Moy is the only important river, but there are many lakes, including Loughs Mask, Corrib, and Carrowmore. Fish abounds, and but for this the wretched peasantry could hardly subsist on their small holdings of poor soil. Except a little coarse linen and rough homespun, there are no manufactures; the quarries of limestone and slate employ but few hands. Mineral resources remain unavailable for want of fuel. It is divided into two single-member constituencies. Castlebar is the county town. Pop. (1901), 199,166.

Mayo, RICHARD SOUTHWELL BOURKE, 6TH EARL OF, was born in 1822 and, after completing his education at Trinity College, Dublin, made a tour in Russia, a record of which he published in 1845. Two years later he entered Parliament, and sat in the Commons until his accession to the Lords in 1867. In each of the three Derby Administrations he served as Chief Secretary for Ireland, and was holding the same post under Mr. Disraeli, when in 1868 he was appointed Governor-General of India. Setting his face against annexation, he strove to win the confidence of feudatory princes and of independent neighbours, especially in the North-West. Meanwhile great internal reforms were carried out in finance, local government, irrigation, education, especially amongst the Mohammedans, legal codification, and gaol management. In 1872 he was killed by a fanatic at the Andaman Islands' convict settlement.

Mayor, the title of a chief magistrate, or of a chief officer, derived through the French *maire*, from the Latin *maior*, "greater," "elder" (whence also "major"). In England and Ireland the chief magistrate and head of the municipal council in a city or borough has the title of mayor, the chief magistrates of London, Dublin, York, and (since 1893) of Belfast, Leeds, Liverpool, Manchester, Birmingham, Sheffield, Bristol and Cork, being styled Lord Mayor. By the London Government Bill of 1899 mayors of various metropolitan areas were created. For *Mayor of the Palace* see CHARLES MARTEL, PEPIN.

Mazanderan, a province of Persia, 220 miles long by 60 miles broad, and occupying an area of about 10,000 square miles, between the Caspian Sea, the Elburz range, and the provinces of Astrabad and Gilan. The N. portion, near the Caspian shores, is level, being partly under cultivation for rice, sugar, and cotton, partly covered with jungle. Towards the S. the land rises rather suddenly to join the spurs of the Elburz, and the peak of Damavand attains a height of 18,600 feet. The climate is unhealthy, though the upper plateaus are fairly salubrious. The province is rich in minerals and petroleum, and, besides the products above-named, yields oranges, lemons, silk, and caviare for exportation, Baku being the nearest trading centre. It is administered by a governor, and the inhabitants are by no means turbulent.

Mazarin, JULES, or GIULIO MAZZARINI, Cardinal and Minister of France, was born in 1602. He became in 1634 Vice-Legate at Avignon, whence he was transferred to Paris. Richelieu induced him to change his nationality, and procured his elevation to the rank of cardinal. Louis XIII. in his will named him as a member of the Council of Regency (1643), and Anne of Austria, the Regent, delegated to him almost absolute power. The victories of Rocroy, Nordlingen, and Lens, followed by the Peace of Westphalia, conferred great prestige on him; but in 1648 the combination of discontented noblemen known as La Fronde (q.v.) broke out into civil war. It was not until 1653 that he finally gained the advantage over his opponents, and during the next eight years he paved the way by his policy for the glorious epoch of Louis XIV., the Peace of the Pyrenees, concluded with Spain 1659, being one of his most important achievements. He died in 1661.

Mazeppa, a Cossack hetman or prince, was born in Podolia about 1640. He entered the service of a Polish lord, who, suspecting him of an intrigue with his wife, had him bound to the back of a wild horse. The animal carried him into the Ukraine, where he was released by some peasants, settled amongst them, and rose in 1687 to be hetman. Peter the Great conferred on him the title of Prince, but he betrayed his benefactor, and fought against him under Charles XII. of Sweden. When the latter was defeated at Pultawa, Mazeppa fled, and died at Bender in 1709. He owes his fame chiefly to the well-known poem.

Maxini, GIUSEPPE, the son of a Genoese physician, was born in 1808. He graduated at the

university of his native town, and plunged eagerly into the patriotic movement, joining the Carbonari, but soon becoming disgusted with the unpractical methods of that secret society. In 1830 he was arrested by the Sardinian Government and thrown into the fortress of Savona. Here he matured his plan for the formation of a new party, *La Giovine Italia* ("Young Italy"). On his release he began action at once by addressing from Marseilles a letter to Charles Albert, who, however, banished him from his dominions. Later on Louis Philippe expelled him from France. He now settled at Geneva, where he edited *L'Europe Centrale* and organised an expedition under General Ramorino to rescue Savoy, taking part himself in that wretched fiasco, and being condemned to death in his absence. In 1837, banished from Switzerland, he arrived in London, whence he directed the efforts of his disciples, and published his treatise on *The Duties of Man*. In 1848 he joined Garibaldi in the war against Austria. He was a member of the Provisional Government of Tuscany, and of the Roman Triumvirate in 1849, but had to yield to French arms, and return once more to England. As president of the National Italian Committee he promoted the insurrections of 1852-53, and the Genoese rising of 1857, for which he was a second time sentenced to death. The successful policy of Cavour proved fatal to his aspirations, and the unification of Italy was affected without his aid. He refused to accept his pardon at the hands of the king, but was permitted to reside in Italy, and died at Pisa in 1872.

McKinley, WILLIAM (b. 1844, d. 1901), President of the United States, was by profession a lawyer. His Tariff Bill of 1890 brought him into prominence, and in 1896 he was elected to the Presidency by a large majority. He was again successful in 1900. In 1901 he was assassinated by an anarchist.

Mead, a strong alcoholic beverage made by adding a ferment such as yeast to a mixture of honey and water with flavouring. The name used to be applied to other strong liquors. A kind of mead made in water was called metheglin.

Meadow-sweet (*Spiraea Ulmaria*), a beautiful British plant belonging to the rose tribe. It grows abundantly in wet places, reaching a height of several feet. Its stems are tinged with red; its leaves, pinnate with a large terminal lobe, a serrate margin, and rather a dark green colour; and its small cream-coloured and fragrant flowers, crowded in a dense and elegantly-branched terminal cluster, technically known as an *anthela*.

Meagher, THOMAS FRANCIS (Meagher of the Sword), was born in 1823 at Waterford, Ireland. Joining the Young Ireland party in 1845, he denounced O'Connell's pacific policy, and attached himself to Smith O'Brien and John Mitchel, the founder of the *United Irishman*. All three were arrested, tried for seditious writing and speaking, and acquitted. Mitchel, however, was subsequently transported under a special Act, and his two friends openly took up arms with their supporters, "the Confederates." Then followed the

absurd affair at Ballingarry (1848), soon after which Meagher was caught, convicted, sentenced to death, and ultimately sent to Van Diemen's Land. He escaped in 1852, and went to New York. In the civil war he sided with the North, raised the Irish Brigade, fought at Bull's Run and Fair Oaks, and received several good posts. From 1865 to 1867 he acted as Governor of Montana, in spite of Republican opposition. He was accidentally drowned in the Missouri at Fort Benton.

Meal-worm, the larva of a moth known as *Pyralis farinalis* (Linn.). It is very common in meal and used as food for cage-birds. The species is of interest as the type of the Pyrales, one of the groups of Microlepidoptera.

Mean, in mathematics, is a sum of a series which comes between two other sums and bears a certain relation to them. The arithmetic mean of two numbers is half their sum, the geometric mean is the square root of their product, and the harmonic mean is twice the product of the two numbers divided by their sum. Between two given numbers it is possible to insert any number of terms such that they form a series in arithmetical, geometrical, or harmonical progression. The terms so inserted are also called *means*.

Measles (*Morbilli*), an infectious disease characterised by a peculiar skin eruption with associated affection of the mucous membrane of the respiratory tract. Measles is exceedingly infectious, and is capable of transmission from person to person at a very early stage, indeed before the precise nature of the malady is definitely declared by the appearance of the characteristic symptoms. It thus happens that most people are affected by the disease in early childhood, and the individuals so attacked appear to acquire "protection" against subsequent attacks. Measles is therefore uncommon in adults, though in some exceptional instances a second or third attack of the disease has been known to occur in the same individual. After exposure to infection, a period of incubation ensues of from 12 to 14 days' duration. After the lapse of this time a person who is susceptible and unprotected becomes feverish and suffers from headache; there is watering of the eyes, sneezing, and sometimes hoarseness and cough. On the fourth day after invasion the fever increases and the characteristic eruption develops. It usually appears first on the forehead, and then travels downwards, involving the whole surface of the body, but particularly affecting the back. The rash attains its full development in two or three days, and then gradually disappears, leaving behind it, as a rule, some degree of bran-like desquamation. When the rash begins to fade the temperature usually suddenly declines, and, in the absence of complications, convalescence soon becomes established. The rash is slightly elevated above the surface of the skin. It is of a dusky pink colour, and the papules of which it consists are often arranged in a crescentic manner. It is liable to be confounded by the uninitiated with the eruption of scarlet fever, and in some instances small-pox in its early stages has been mistaken for measles. Certain

complications are apt to supervene upon an attack of measles, particularly laryngitis, bronchitis, and pneumonia, while purulent ophthalmia and suppuration of the middle ear are not uncommon. Treatment consists in keeping the patient in bed in a well-ventilated room, protecting him from draughts, and feeding him during the febrile stage upon an ordinary sick diet. When convalescence is established tonics may be administered, and a more substantial diet adopted. Should complications appear, they would require special treatment. In order to prevent the spread of the disease the patient should be absolutely confined to his room during convalescence, and should not be allowed to associate with other children for at least three weeks, and then only if all desquamation and cough have ceased. The sick chamber and clothes, bedding, etc., must, of course, be properly disinfected.

German measles (*rötheln*) is an infectious disease, closely resembling, and often confounded with, measles. The period of incubation is probably shorter than in measles, the initial febrile stage is shorter than in that malady, and the cold in the head is absent or is a less marked phenomenon. Sore throat is, on the other hand, usually complained of, and it is said that in *rötheln* there is a tendency to the enlargement of the lymphatic glands. The disease is, on the whole, milder than measles, and is rarely attended by complications. Measles and *rötheln* are not mutually protective.

Measured Mile, a measured sea-course of one mile (knot), whereon ships may steam their trial trips. There is usually one in the vicinity of every great naval port. Steam-ships tried on the measured mile are generally provided with selected coal and picked stokers, and are, moreover, clean. They do not commonly, therefore, ever subsequently do as well again.

Meath, a county on the E. coast of Ireland, in the province of Leinster, bounded on the E. by the Irish Sea, S.E. by Dublin, S. by Kildare and King's County, W. by Westmeath, N.W. by Cavan and Monaghan, N.E. by Louth. It has an area of 904 square miles, most of which consists of slightly undulating land, with a deep rich deposit of loam resting on a subsoil of limestone. The picturesque river Boyne flows from S.W. to N.E., and divides the county into two nearly equal parts. Except the Bog of Allen, nearly the whole is under cultivation, and upwards of ninety per cent. of the land is arable, yielding excellent crops. Except a few linen and woollen fabrics, there are no industries save agriculture, and the ten miles of coast do not support many fishermen. Trim is the chief town. The county sends two members to parliament, and gives its name to a bishopric. Pop. (1901), 67,497.

Mecca (Arab. *Makka*), the birthplace of Mohammed, and the religious centre of the Moslem world, is a city about 45 miles due E. from Jidda on the Red Sea, and is the capital of Hijaz, a province of Arabia. The houses are fairly built, and the streets tolerably wide; but the cramped position of the city in a deep valley, the utter want of drainage, and the overcrowding at the holy

season, give occasion to fearful epidemics, whilst in the rainy weather floods are a constant source of danger. The Great Mosque (Beit Allah) occupies a level site about the middle of the city, and encloses within a rectangular cloistered court the famous Kaaba (q.v.). The great pilgrimage of the year takes place in June and July, when as many as 100,000 *hajis* often assemble. Burckhardt, Burton, and Von Maltzahn are among the few unbelievers who have visited the holy places.

Mechanics, the name generally given to the science of force, is more properly confined to the study of forces on machinery (*mechanē*, a machine). It involves primarily kinematics, the science of motion, and in many cases the consideration of the acting forces is much less important. The simple machines investigated in elementary dynamics, otherwise termed the *mechanical powers*, are the lever, the wheel and axle, the three different systems of pulleys, the inclined plane, the screw, and the wedge. The two first are in principle identical, as also the three last. The hydraulic press constitutes another such simple machine, but it depends for its action on the characteristic property of a liquid (q.v.). [DYNAMICS.]

Mecklenburg, a district of north Germany upon the Baltic Sea, which was occupied in the 7th century by a Vandal race, whose Slavonic blood is still perpetuated in the ruling families. In 1160 it was annexed by Saxony, and later on passed under Danish supremacy, but was soon restored. Divisions began in 1229, and went on for centuries, resulting in the final partition (1701) into Mecklenburg-Schwerin and Mecklenburg-Strelitz, the latter having previously been called Mecklenburg-Güstrow. Mecklenburg-Schwerin lies W. of Mecklenburg-Strelitz and Pomerania, E. of Ratzeburg and Lauenburg, N. of Brandenburg and Hanover, and has an area of 5,117 square miles and a considerable coastline. It comprises the duchies of Schwerin and Güstrow, the district of Rostock, the principality of Schwerin, the barony of Wismar, and other minor constituents. The government is in the hands of a Grand Duke, under a constitution which retains much primitive feudalism; but for military purposes both duchies are absolutely subordinate to the Imperial Government, and a contribution of about £100,000 annually is made to the Berlin exchequer. The flat, alluvial soil is fairly productive, the rivers and canals afford easy carriage, the coast and lakes supply abundance of fish, and the shipping interest grows stronger year by year. Industries such as wool-spinning, brewing, tanning, distilling, and cigar-making flourish, whilst mines exist here and there, and the amber gathered on the shore is a valuable export. Mecklenburg-Strelitz consists of two distinct portions, viz. the duchy of Strelitz, lying E. of Mecklenburg-Schwerin, and the principality of Ratzeburg to the W. The total area is 1,126 square miles. The Grand Duke is closely connected by family ties with the ruler of Mecklenburg-Schwerin, and both duchies have a common Landes-Union or Parliament, and a common judicial organisation. They are in other respects distinct.

Medals, metal discs, stamped with some device,

struck to commemorate some event or given for distinction gained in the naval or military service, for heroism or for other merit. In the navy and army medals were, until the 19th century, seldom given to any save officers; but after the accession of Queen Victoria medals were awarded to men of all ranks who had been engaged in certain previous campaigns and actions. These were of silver. For over two hundred actions the same medal was granted, with a distinctive variation in the form of a bar or clasp to be worn upon the ribbon above the decoration. Since the first general introduction of the practice of giving medals to all ranks, the system has been continued in the British services. The term medal also includes any sort of metal disc struck to commemorate a special event or individual. Medals for life-saving are given by the Royal Humane Society, the Royal National Institution, the Board of Trade, the Tayleur Fund, Lloyd's, the Marine Society, etc. After the battle of the Nile Mr. Davison, Lord Nelson's prize-agent, gave, at his own expense, medals in gold, silver, bronze-gilt, or bronze to those who had been engaged. Mr. Boulton acted similarly after Trafalgar, and after St. Vincent Lord St. Vincent gave medals to the people of his flagship. Before the 16th century medals were generally cast or engraved. Among the great medallists may be mentioned Thomas Simon in the time of Cromwell and Charles II.; Pistrucci, who designed the coins of George IV.; D. F. Loos, who died in 1819; G. B. Loos, who died in 1843; and W. Wyon, who died in 1851. Queen Victoria's Jubilee medal (1887), which was given to her Majesty's Household, to the police, etc., was designed by Sir E. Boehm and Sir F. Leighton. The Albert Medal, granted by her Majesty for saving life, was instituted in 1866, divided into two classes in 1867, and made to include gallantry ashore as well as at sea in 1877.

Medea, according to Greek legend, was the daughter of Æetes, King of Colchis, and the niece of Circe, whose magic arts she inherited. Jason, coming to Colchis in search of the Golden Fleece, won her love, and she not only helped him to defeat the wiles of her father, but fled with him later to Greece, slaying her own brother and strewing his limbs in the way to stay pursuit. On reaching Iolchos, Jason found that his father and brother had been murdered by Pelias, who at Medea's suggestion was killed and boiled by his daughters with the idea of restoring him to youth. Driven out of their home, she went with her husband to Cornith, where Jason became enamoured of the king's daughter Glauce, whom Medea destroyed, murdering at the same time her own children. She then betook herself to Athens, and married Ægeus, to whom she bore Medus. For an attempt to poison Theseus she was again exiled, and is said to have returned to Colchis and become reconciled to Jason. Her tragic story has been dramatised by Euripides, Seneca, and Corneille.

Medellin (classic *Metellinum*). 1. A town of Spain on the left bank of the Guadiana about 35 miles E. of Badajoz. It was founded by Quintus Cecilius Metellus, and is still rich in Roman remains.

Here Fernando Cortez was born, and here in 1809 Marshal Victor defeated the Spaniards.

2. The name is also borne by a city of some importance in the Confederation of Grenada, South America, on the flanks of the Andes 50 miles S.E. of Antioquia. It is a mart for local produce, especially coffee.

Media, a province of the Assyrian empire, which revolted towards the end of the 8th century B.C., and enjoyed independence for about a hundred and fifty years, when it was annexed to Persia by Cyrus. Media comprised, perhaps, the districts now known as Azerbaijan, Ghilan, Mazanderan, Irakajemi, and the northern half of Laristan. [PERSIA.]

Medical Jurisprudence. Forensic medicine is the "science which teaches the application of every branch of medical knowledge to the purposes of the law." It deals with the signs of death, with the post-mortem appearances in the case of sudden death, and with insanity, poisoning, birth, infanticide, etc., in their legal relationships. For *poisoning* see the article on that subject.

Medici, the name of a family that has played a great part in Italian history. COSIMO, or COSMO, DEI MEDICI ("The Elder") was born in 1389, and succeeded his father as gonfalonier in 1429. He formed alliances with Francesco Sforza, the Venetians, and the Pope, advanced the commercial prosperity of Florence, and was a liberal protector of art and learning. The Academy and Laurentian Library were founded by him, and he afforded hospitality to many Greek refugees. By his generous support of the poor during a famine he won the title of *Pater Patriæ*, and died in 1464. LORENZO ("The Magnificent"), grandson of the above, was born in 1449, and succeeded his father, Pietro, in 1469, nominally sharing power with his brother Giuliano. The Pazzi were now the opposing faction, and, abetted by Pope Sixtus IV. and Archbishop Salviati, they endeavoured to assassinate the brothers in 1478, but only the younger perished. Lorenzo now had a free hand. He put most of his adversaries to death, alienated Naples from the Pope and so brought the latter to terms, and altered the constitution of Florence so as to make the *balia* or elective council permanent and so secure his continuance in power. Though tyrannical, immoral, and careless in finance, he raised Florence to a high state of prosperity, and directed its foreign policy with no little skill, aiming particularly at creating unity of interests between the republic and the Papacy. His patronage of literature and art was constant and generous. Pulci, Ficino, Poliziano, Pico della Mirandola, and the youthful Michelangelo found a home at his court, and he himself wrote poetry of no slight merit. At his death in 1492 he was succeeded for a couple of years by PIETRO II., his eldest son. [LEO X., CLEMENT VII., CATHARINE DE MEDICI, MARIE DE MEDICI.]

Medicine. Indications of the medical knowledge of the ancients may be traced back many hundred years before the Christian era in Egyptian,

Indian, and Chinese writings and in the Homeric poems. The first approach, however, to anything corresponding to modern medical knowledge is met with in the 5th century before Christ in the writings of Hippocrates (q.v.), and these are so markedly in advance of anything dealing with the same subject-matter that had appeared up to that time, that their author has universally been accorded the title of the "Father of Medicine." Hippocrates founded his system mainly on a close study of the symptoms of disease; of anatomy and physiology he knew little, and the pathology of his time was necessarily very crude. He maintained that health was dependent upon the due admixture in the body of the *four humours*—blood, phlegm, black bile and yellow bile—and thus originated the doctrine of humoralism, which, with the subsequently enunciated doctrine of solidism, formed the basis of much discussion in later days. Hippocrates was a believer in the healing power of nature, and he devoted much attention to the art of prognosis, in which he attained great skill. His famous doctrine of "critical days" was, however, undoubtedly far-fetched, and undue importance was attached to it both by him and by his successors; he also carefully investigated the question of diet. The study of the writings of Hippocrates and the further development of the science of medicine were taken up by many schools, the most famous of which was that of Alexandria, and in this city anatomical investigation was for the first time systematically prosecuted.

With the establishment of the Roman supremacy, Rome became the great centre of medical science, and the state of knowledge in the 1st century A.D. is depicted in the treatise on medicine written by A. Cornelius Celsus. The most famous of the Roman physicians, Galen (q.v.), lived in the second century after Christ. His system was modelled upon that of Hippocrates, and he devoted special attention to the development of knowledge in connection with anatomy, physiology, and the use of drugs. The writings of Aretæus of Cappadocia, who appears to have lived at about the same time as Galen, have acquired considerable celebrity.

The Arabian writers next demand attention; though of much later date, their works present no great advance on the writings of the early centuries of the Christian era. They introduced many new drugs, and mention is for the first time made by them of small-pox and measles. Rhazes, who lived in the 10th century, and his successors, Avicenna and Averrhoës (q.v.), were the greatest of the Arabian writers, and their works were largely read in Europe in a Latin dress, particularly in the great schools of Salerno, Montpellier, and Bologna.

With the revival of learning, the ancient Greek and Roman writings again began to be read in their original form, and men were no longer content to study the writings of the ancients through the medium of their Arabian interpreters. There also arose at this time the system of chemical medicine which is associated with the name of Paracelsus, who lived in Germany in the 16th century. Moreover, certain great epidemics stimulated medical study in the 15th and

the 16th centuries, and syphilis made its appearance in Europe.

In the 17th century came Harvey's (q.v.) great discovery of the circulation of the blood, and the commencement of the application of physical and chemical knowledge to medical science. The Spanish bark was discovered, the plague made its appearance, and in the later years of the century lived the famous Sydenham. This author, who is often called the English Hippocrates, directed attention to the importance of studying the phenomena of disease apart from preconceived theories as to the nature of morbid processes. He invented the celebrated phrase, "epidemic constitution," and minutely described the epidemic diseases prevalent in London during a series of years. He was a great advocate of bleeding, but introduced many improvements in methods of treatment.

During the 18th century flourished the great teachers Boerhaave, Stahl, and Haller, the works of Morgagni on anatomy and of Cullen on medicine appeared, and the treatises of Fothergill on the putrid sore-throat, of Huxham on epidemic fevers, and the commentaries of Heberden were written. At the end of the century came the momentous discovery of vaccination by Jenner. Avenbrugger's work on percussion appeared in 1761, but it was not popularised until it was translated many years later by Corvisart. The method of physical diagnosis was completed by Laennec, who invented auscultation.

Some of the chief additions to knowledge made in the first half of the 19th century have been those of Bretonneau, who described diphtheria; of Trousseau; of Richard Bright, who gives his name to Bright's disease; and of Addison, who gives his name to Addison's disease; while Graves and Stokes of Dublin should also be mentioned. In Germany Skoda developed the work of Laennec, and Virchow founded the cellular pathology.

In 1821 Sir Charles Bell demonstrated the function of the anterior and posterior roots of the spinal cord, and then followed a steady advance in the knowledge of the pathology of the nervous system, which resulted in more recent years in the unravelling of the mysteries of diseases of the spinal cord by Duchenne and by Charcot. The year 1849 is remarkable for the announcement by Dr. Snow of the possibility of the conveyance of the infection of cholera by drinking water, and for the demonstration by Sir William Jenner of the difference between typhoid and typhus fevers.

The great discovery of the anæsthetic influence of ether was made shortly before the middle of the century, and soon afterwards followed the demonstration of the utility of the clinical thermometer, and then subsequently the discovery of the laryngoscope and ophthalmoscope. The advances of recent years have been made on two great lines of new departure. In the first place, there has been the growth of preventive medicine, or sanitary science, with resulting diminution of the mortality from preventable disease and the material reduction thereby effected in the general death-rate; and, secondly, the growth of the germ theory of disease, which has profoundly modified medical science and treatment. Davaine's discovery of the bacillus of

anthrax, Pasteur's brilliant researches, and in recent times the wonderful discoveries of Koch, may be noted as conspicuous instances of the work which has been, and is being, done in this branch of knowledge, and which has already so greatly modified, and is probably destined still further to modify, the practice of medicine.

Medina, or EL-MEDINA ("the City"), sacred to Mussulmans as the place to which Mohammed fled from Mecca, and in which he lies buried, occupies a hollow in a plateau forming part of the range that flanks Arabia on the W. It is in the Hijaz, about 250 miles N. of Mecca. Strong walls, with handsome gates, surround the city proper, which is well built, clean, and supplied with abundant water. The Mosque of the Prophet (El Haran) is in the eastern quarter, and contains the grave of Mohammed, with those of Abubekr and Omar on either side, and that of Fatima close at hand. The hut of Ayesha, in which the teacher died, is supposed to have stood on this spot, and it was outside the original mosque in which he preached. The present building is the result of many additions.

Mediterranean Sea, THE, is the mass of water which separates Europe from Africa, and in its eastern part washes a comparatively small strip of the coast of Asia. Its length from Gibraltar to Syria is 2,100 miles, and its breadth varies from 500 to 250 miles. Excluding the Black Sea and the Sea of Azov, the area may be reckoned at about a million square miles. At the N.E. corner of the Ægean Sea, which forms its outmost limb, a narrow passage, the Dardanelles, leads through the Sea of Marmora and the Bosphorus to the Euxine or Black Sea and the Sea of Azov beyond. Its tides are trifling, and, owing to evaporation and impeded circulation, the water of the Mediterranean is far saltier and heavier than that of most other less confined seas. The current in the straits of Gibraltar always flows west on the surface, and it was long a mystery how the volume of the inland sea was kept constant, until recent observations showed the existence of a submarine inflow which more than compensates for the outflow. As a whole, the Mediterranean is a shallow sea. Between Malta and Crete, and between Naples and Sardinia, it attains 2,000 fathoms, or a little more; but towards the W. the bottom shelves up to 300 or 400 fathoms, and between Tunis and Sicily a ridge extends at a depth of 200 fathoms. The mean temperature at 100 or 150 fathoms is 54° to 56° Fahr.

Medlar (*Mespilus germanica*), the only European species of a genus of Rosaceæ, sometimes reckoned only a sub-genus of *Pyrus*, is a small much-branched tree, native to western Asia and central and southern Europe, and has been long known as a fruit-tree. When wild it is spinous, and its twigs branch at right angles. The leaves are oval, lanceolate, and larger in the cultivated forms. The white flowers are solitary and terminal, and the globular fruit becomes brown, and has the withered leafy lobes of the calyx projecting from the upper edge of the five distinct carpels, or stony divisions of the core, which are not enclosed by the receptacular tube as in an

apple. [POME.] The flesh is at first hard and uneatable, but undergoes a change, called *bletting*, by which it becomes soft, sub-acid, and edible.

Médoc (Lat. *Medulicous Pagus*), a district of the Bordelais, France, forming a sort of peninsula between the river Gironde and the ocean, and comprised within the department of the Gironde. The area is about 386 square miles, most of it being bare, rocky, slightly undulating, and sparsely watered. The soil, however, is admirably suited to the wine-grape, and here the finest quality of Bordeaux is produced. The whole country is divided into vineyards, each of which has its characteristics, though the produce of certain neighbourhoods is known by a generic name, such as Grave, Pauillac, etc. Château Margaux, Château Lafitte, and Château Latour are amongst the most celebrated growths. Within the last twenty years the phylloxera has played havoc with the vines of Médoc, which used to yield 40,000 tuns.

Medulla. [PITH.]

Medusæ, the young of many forms of Hydrozoa (q.v.). They are bell-shaped organisms consisting of a hemispherical fleshy disc, from the centre of which hangs a soft tube, and the mouth opens at the free end of this, and leads to a large cavity, the atrium, from which radiate a number of gastric canals.

Medway, a river of England which, rising, partly in Surrey and partly in Sussex, flows N.E., chiefly through Kent, for a distance of 58 miles till it joins the Thames near Sheerness by an estuary 12 miles in length. Tunbridge, Rochester, and Maidstone are upon its banks, and it is navigable for vessels of some size as far as the latter town, whilst boats and barges can ascend to Penshurst.

Meerschaum (sea foam), a creamy-white and very light hydrous silicate of magnesium ($Mg_2Si_2O_5 + 2H_2O$), derived, no doubt, from the decomposition of some anhydrous, rock-forming magnesian silicate, and occurring in nodular masses, which have occasionally been found floating on the Black Sea. It is opaque and earthy; has a hardness between 2 and 2.5, and a specific gravity between .99 and 1.28; breaks sometimes with a conchoidal fracture, and adheres to the tongue. It is mainly obtained in Asia Minor, from 8,000 to 10,000 cases, of from $\frac{3}{4}$ to 1 cwt. each, being yearly shipped from Smyrna for Vienna. Owing to its porosity it is used almost exclusively for tobacco pipes; but half the so-called meerschaum pipes are imitations, made either of plaster of Paris and paraffin or, it is said, of potato.

Meerut, or MIRATH, a division, district, and capital city in the North-West Province of British India. The former includes six districts, viz. Dehra Doon, Saharanpur, Muzaffarnagar, Meerut, Bulandshahr, and Aligarh, and has an area of 11,138 square miles, forming part of the Doab. The district lies to the W. of the Ganges and the E. of the Jumna, having Muzaffarnagar and Bulandshahr to the N. and S. respectively. It consists of a narrow plain about 2,361 square miles in extent, with a slight slope from N. to S. With the exception of some small patches

of jungle or sand, the whole is carefully irrigated and cultivated, and yields immense crops of grain, cotton, and indigo. The chief modern centres are Meerut, Ghaziabad, and Mawana. Sindhia ceded the territory to the British in 1803. The East Indian and the Punjab and Delhi railways together with numerous canals afford abundant means of intercommunication. Meerut, the capital, standing halfway between the Jumna and Ganges, is an ancient town, but owes its present importance entirely to the large cantonment which lies S. of the poor and uninteresting settlement and accommodates a whole division. The Mutiny started here in 1857.

Megalithic, a term applied to monuments, probably sepulchral, consisting of huge unhewn stones—dolmens, circles, avenues, and menhirs. It is opposed to *Microlithic*, which is applied to monuments in which small squares or hewn stones were used.

Megalosaurus, a huge reptile, the type of a family Megalosauridæ, in the carnivorous order Theropoda of the sub-class Dinosauria (q.v.), which occurs in Oolitic and Wealden deposits in England. *M. Bucklandi*, from the Stonesfield Slate (Bathonian) is estimated to have been 25 feet long and to have weighed two or three tons. It had only four toes to each foot, and, like many carnivorous mammals, was digitigrade, with prehensile claws. Its fore-limbs are very small and limb-bones hollow; but both its thigh-bone and leg-bone are three feet in length; so that it probably walked erect. It has trenchant, curved, pointed, and finely serrated teeth, and fed probably on the molluscs, fish, and small rat-kangaroos on the shores of the lagoons by which it lived.

Megaphone. An instrument used by marine officers, fire chiefs, and others, for adding volume to the voice. Also used for the same purpose by conductors of open-air theatricals, pageants, &c. It is shaped like a funnel and varies in length, but is mostly about 36 inches.

Megapodes. [MOUND-BIRDS.]

Megaris, the name of the district surrounding the town of Megara, and comprising about 143 square miles of the broader part of the Isthmus of Corinth. It is traversed by the range of Geraneia, and the only plain it possesses is the White Plain, upon which Megara stood. This town attained great power in the 8th century B.C. Constitutional troubles ensued and weakened the state, which could not resist the growing influence of Athens. Megara allied herself with Athens in the struggle against Sparta, but changed sides, and suffered terribly.

Megatherium, a gigantic representative of the Edentata (q.v.), found fossil in Pleistocene rocks in America. The best known species, *M. americanum*, had a body 13 feet long, which was equal in bulk to that of the elephant, but with shorter limbs and with a powerful tail 5 feet long. The skull and teeth resemble those of the sloths; the rest of the body that of the ant-eaters. The first digit of the hand and two of the toes were aborted, and three fingers of each hand and one toe of each foot have

enormous claws. The fore-limbs are longer than the hind ones, and the heel in the latter projects almost as far backwards as the foot does forward. The animal undoubtedly fed upon leaves, sitting up and clawing them down. Complete skeletons from Buenos Ayres are in the Natural History Museum and in that of the College of Surgeons, and smaller species have been found in Brazil, Georgia, and South Carolina.

Megrim (MIGRAINE, HEMICRANIA) is a form of headache, which usually recurs at tolerably definite intervals, and which sometimes is limited to one half of the head. This disease is eminently hereditary, and usually occurs in families which have a history of nervous complaints. It commences, as a rule, in early childhood, and the attacks diminish in intensity after middle life. In addition to the pain in the head, there is sometimes vomiting and dimness of sight. A peculiar symptom which is occasionally present is *hemiopia*—that is to say, there is a temporary dimness of vision as far as one half of the visual field is concerned. The outer boundary of the dim area is sometimes limited by an outline, which has been described as resembling that of a fortification. An attack of megrim usually lasts for eight or ten hours; it may be brought on by errors in diet, over-fatigue, or by breathing a polluted atmosphere. As regards treatment, careful attention to diet and the use of tonics are indicated. During the attack bromides, antipyrin, and caffeine have, in some instances, been found to give relief.

Megrim is also a term applied to a disease affecting the horse, in which the animal is subject to giddiness or to attacks of insensibility.

Meiningen, the capital of Saxe-Meiningen, and the judicial centre of that duchy as well as of Saxe-Coburg and the districts of Schmalkalden and Schleusingen, is situated on the Werra, 40 miles S. of Eisenach. The old town must have been founded about ten centuries ago, for the parish church dates from 1003. The bishops of Würzburg were supreme here till 1542, and the dukes of Saxony held it for about 100 years, when it passed to Saxe-Altenburg, being assigned to Saxe-Meiningen in 1680. Around the ancient portion pleasant suburbs have sprung up, with a fine park, a new palace, and other handsome buildings. The Elisabethenburg, where the dukes formerly resided (1682), is now a museum. The theatre, under the patronage of successive rulers, has become famous throughout Europe.

Meissen, an ancient centre of industry, stands on the left bank of the Elbe in Saxony, about nine miles N.W. of Dresden. Founded in 928, it became the seat of a powerful line of margraves, from whom the dukes and kings of Saxony descend. Until 1581 the prince-bishops of Meissen were most important personages. The cathedral, completed about 1400 (with the exception of the tower, which dates from the 15th century), is a noble specimen of early Gothic. The Schloss, begun in 1473, has been restored and redecorated with modern frescoes. Across the river, spanned by a 13th-century bridge,

is the Fürstenschule, where Lessing and Gellert were educated, occupying the site of the former convent of St. Afra. The town-hall, the Frauenkirche, and many other remarkable buildings adorn the quaint and hilly streets. Meissen contains the famous factory where Dresden china is made, and has also iron-works, breweries, sugar-refineries and other industrial establishments, besides doing a large trade in the wine of the district.

Meissonnier, JEAN LOUIS ERNEST, was born in 1815, but was early taken to Paris, where he studied art under Potier and Cogniet. He exhibited as a youth water-colour and oil-paintings at the Salon, where *The Chess-players* attracted some notice in 1836; and he soon started that series of minutely-finished and faithful studies from French history, especially in its military aspects, upon which his fame chiefly rests. *Napoleon I., Campaigne de France, 1814, Cuirassiers, 1805, Friedland, and Solferino* are among his most famous efforts. Of his *genre* pictures *La Rixe, La Lecture chez Diderot, La Lecture du Manuscrit, and Les Amateurs de la Peinture* deserve special mention. The Grand Cross of the Legion of Honour, the membership of the Institute, and the honorary title of Royal Academician were conferred on him in his later years. He died in 1891.

Mekong (Chin. *Lan-tsang-Kiang*; Tibet. *Dukio*), a river in farther Asia, which takes its rise near Chiamdo, in Tibet, flows S. through the peninsula of Siam, and, after a course of about 2,800 miles, discharges itself into the China Sea in Cochin China or Cambodia. It carries down vast quantities of silt, and the delta of Cochin China, through which it makes its way in several channels, is formed of its alluvium. The current is extremely languid near the mouth, and rapids and shoals occur higher up; but despite these obstructions, the river has been navigated as far as Chinese territory, though it is not likely to become an important commercial route. Serious floods occur in the rainy season, and are swelled towards the mouth by the Semun, Udong, and other affluents.

Melæna, the term applied to the condition in which altered blood appears in the stools. If bleeding occurs into the alimentary canal, the action of the digestive juices upon the blood is such that its red colour is lost, and a black appearance is produced in the discharges which are passed *per anum*. The word melæna, which is derived from a Greek word signifying "black," is hence appropriately applied to the condition. Melæna may be due to hyperæmia, ulceration, or new growth affecting the stomach or intestines. It occurs in malaria, purpura, and scurvy, and supervenes in cases of obstruction to the portal circulation due to liver disease or to other causes.

Melancholia. [INSANITY.]

Melanchthon, PHILIP, whose real surname, SCHWARZERD, was Græcised by the pedantry of his age, was born in 1497. After finishing his studies at Tübingen under Reuchlin, he began to lecture publicly on the classics. In 1518 he was appointed to the chair of Greek at Wittenberg.

where he assisted Luther in translating the Bible, and soon adopted his theological views. He filled Luther's place during his confinement in the Wartburg (1521), having previously published his first treatise in support of the authority of the Scriptures as against that of the Fathers. In 1526 he was appointed as one of the commissioners, in accordance with the result of the Diet of Spires, to visit the reformed communities. At the Marburg Conference he argued with Zwingli on the doctrine of the real presence, and next year (1530) he drew up the Augsburg Confession. He was not averse to a compromise with Rome, whose errors he regarded as outgrowths rather than wilful impostures; and this spirit, which showed itself in the reservations with which he signed the Smalkalden Articles, comes out more clearly after Luther's death. His attitude towards the overtures for reconciliation made in 1547, led to the adiaphorist controversy as to what matters were or were not indifferent to the faith. His later years were somewhat marred by bitter and profitless disputes not only with Romanists, but with reformers also. He died in 1560, and was buried beside Luther in Wittenberg church. His two chief works are entitled *Loci Communes Rerum Theologicarum*, *Libellus Visitatorius*, and *An Apology for the Augsburg Conference*.

Melanésians ("Black Islanders"), a main division of the Polynesian peoples, who constitute the dark element in the Pacific Ocean, where they are in almost exclusive possession of the Solomon, Santa Cruz, New Hebrides, Loyalty, and New Caledonian groups, from them collectively called *Melanésia*. They also form the substratum of the population in the western parts of Fiji, and have left traces of their presence in New Zealand, the Marquesas, and other eastern archipelagoes, all of which were occupied by the black race before the arrival of their present brown Indonesian inhabitants. The Melanésians, who number about half a million altogether, do not differ essentially from the aborigines of New Guinea and of the neighbouring islands in the eastern parts of the Malay archipelago, forming with them the Oceanic section of the Negro race collectively classed as Papuans. [PAPUANS.] Physically they differ altogether from the Eastern Polynesians, being of much smaller stature (rather below the middle size), and of far darker complexion (sooty brown and even black), with black frizzly hair ("mop heads"), and highly dolichocephalic (long) skulls. The crania of the extinct Kai-Colo Melanésians, found in Viti Levu (West Fiji), show this last trait in a higher degree than any other known race; but, notwithstanding the physical differences, the Melanésians greatly resemble the Polynesians (Samoans, Tahitians, Tongans, Maori, Hawaiians) in their usages, traditions, religion, and speech. It is noteworthy that all the Melanésian languages hitherto studied are found to belong to the Malayo-Polynesian linguistic family, and are even of more archaic type than most other members of the group. This is one of the most puzzling phenomena in the whole range of anthropology, though its explanation may lie in the insular character of the Melanésian domain

exposing it more easily to contact with the seafaring Polynesians, from whom they may have received their present languages, together with many social usages, at a very remote period. In general, however, they stand at a considerably lower stage of culture, and, although more industrious under European control (hence making good coolies), they are still for the most part mere savages, inveterate head-hunters, and cannibals. Yet some have been brought under Christian influences sufficiently to have abandoned these practices, by several zealous Protestant missionaries, such as Bishop Pattison (murdered in 1871) and Dr. Codrington, first of living Melanésian scholars. (H. C. von der Gabelentz, *Die Melanésischen Sprache*, 1873; R. H. Codrington, *The Melanésian Languages*, 1885.)

Melbourne, the capital of Victoria, Australia, derives its name from the Prime Minister in the early part of whose period of office it was founded. On the Proclamation in 1901 of the Australian Commonwealth Melbourne was made the centre of administration and the seat of the Federal Government. In the winter of 1909, however, a site at Yass-Canberra (N.S.W.) was chosen, on which to build a new Federal capital. Melbourne occupies a fine, but not picturesque, site at the head of Hobson's Bay, a northern inlet of the large bay of Port Phillip, the actual city being 3 miles inland on the Yarra river; but the suburbs extend on all sides of this centre, and line the shore for many miles. Both Anglicans and Roman Catholics have bishops here, and maintain cathedrals of architectural merit. Journalism is established on a secure basis, and the leading newspapers vie with those of London in value and ability. Railways afford ready communication with the suburbs, with Sydney, 500 miles distant to the N.E., with Gippsland, and with South Australia. The climate is healthy and equable, though hot winds from the interior occasionally raise the temperature and fill the air with dust. The shipping of Melbourne has developed enormously within the last thirty years, the tonnage entering in 1907 being 498,720, and clearing 244,526. Wool, preserved meat, wheat, gold, and some kinds of timber are the chief exports, the manufactured goods of Europe and the west being taken in exchange, though recently Victoria has made great strides in the matter of home industries. Until 1835 no white man had set foot in this land, yet in 1838 town lots were worth £250 an acre, and would be cheap now at 100 times that price. In 1841 there were 11,000 inhabitants, but the great impulse to the growth of the place was given by the discovery of gold in 1851. The population at once rose to 100,000, and the colony was made independent of New South Wales. In 1908 the population was estimated to be 543,600.

Melbourne, WILLIAM LAMB, 2ND VISCOUNT, was born in 1779, and entered the House of Commons in 1805 as a moderate Whig. Canning gave him the Chief Secretaryship for Ireland, which he held with much credit, and he also served under Lord Goderich and the Duke of Wellington. In 1828 he succeeded to the peerage, joined Earl

Grey's Cabinet as Home Secretary, and had a large share in passing the Reform Bill. He became Premier in 1834, holding office until 1841, in spite of declining popularity. Every device was used to discredit him, and in 1836 he was unsuccessfully sued for misconduct with the Hon. Caroline Norton, the gifted daughter of Thomas Sheridan. He secured the thorough confidence and esteem of the youthful Queen, a circumstance that enabled him no doubt to keep in office for so long, in spite of incapacity for business and inattention to duties. After his retirement he took little interest in politics, dying at Melbourne House, Derbyshire, in 1848.

Melchites, a name applied after the Council of Chalcedon (A.D. 451) to orthodox members of the Eastern Church by the Nestorians or Monophysites. The term is also applied to members of Christian communities in Syria and Egypt which once belonged to the Greek Church but have entered into communion with the Latin Church.

Melilot (*Melilotus officinalis*), an annual or biennial leguminous plant, growing erect, two or three feet or more high, branched, and sometimes woody. Its leaves have bristle-like stipules, long stalks, and three stalked leaflets; and its small yellow flowers are in long racemes, and droop to one side of the stem. The short, straight pods become black, and contain one or two seeds each. When dry the plant has the fragrance of new-mown hay from the presence of the fragrant principle *coumarin* ($C_9H_6O_2$). Its flowers are sold by herbalists as *balsam flowers*. It occurs in a wild state throughout Europe and Asia.

Melinite, an explosive, believed to be composed of fused picric acid, mixed with guncotton, dissolved in ether, and compacted into granules. In some cases gum-arabic and chlorate of potash are said to be added. Its specific gravity is 1.7. It is exploded by a detonator, and upon explosion produces large quantities of poisonous carbonic acid gas. Secrecy is maintained as to its manufacture, owing to the fact that the process is the property of the French Government, but it is considered to be similar to the British lyddite. The use of picric acid as a military explosive was first patented in 1885 by M. Turpin, who it is known transferred some of the results of his researches to the French War Office.

Melissyl Alcohol, an alcohol of composition $C_{30}H_{61}OH$, which occurs united with palmitic acid in beeswax. If oxidised, it yields *melissic acid*, $C_{30}H_{59}O_2$, a waxy substance which melts at 88° .

Melodrama, properly a stage-play set to music, or a play in which music is freely employed. The term is now used, with little or no reference to incidental music, to designate a stage-play of a romantic character in which a highly sensational plot with extravagant scenes and situations leads up to a cheerful solution.

Melon (*Cucumis melo*), a member of the gourd family (Cucurbitaceæ), probably native to India and cultivated in Asia and in Egypt from very early times. The melon is generally annual, and

has tendrils, variable palmately-lobed leaves, monœcious flowers, and deeply five-lobed bell-shaped corollas. Having so long been cultivated its fruit is extremely variable. It may be globular, oblate, ovoid, or even serpent-like, smooth, netted, ribbed, or warty, green or yellow externally, and white, green, salmon or red in the "flesh," and from one to twelve or more inches in diameter. Cabul, Bokhara, and Ispahan are specially celebrated for their melons, many of the "races" of cultivation having originated in Persia. Columella introduced melons into America, where they flourish, as they do also in Australia. True melons were formerly termed *musk melons* to distinguish them from *water melons* (*Citrullus vulgaris*), native to tropical Africa, cultivated in ancient Egypt and now in most hot countries. A large number of melons and water-melons are imported into England from Malaga and Lisbon.

Melrose, a pleasant village on the Tweed, Roxburghshire, Scotland, 37 miles S.E. of Edinburgh. It is famous for the ruins of the Cistercian abbey church, built originally by David in the 11th century, but twice destroyed, the fragments remaining being those of the third church, which was erected between 1485 and 1530. It is a fine example of the Middle Pointed Gothic, with fine shadowings of the Flamboyant and Perpendicular styles. The heart of Bruce, with the bodies of Alexander II. and many Border celebrities, were buried here. Sir Walter Scott recorded the glory of the abbey in *The Lay of the Last Minstrel*, a Abbotsford, his country seat, is close to the town.

Melting-point. The following table gives the melting- or freezing-points of a few important and well-known substances:—

	—40° Centigrade	or—40° Fahrenheit.
Mercury	—40°	—40°
Turpentine oil	—27°	—17°
Ice	0°	32°
Butter	33°	91°
Phosphorus	44°	111°
Spermaceti	between 44° & 49° C.	or between 111° & 120° F
Wax	65° & 68°	149° & 154°
Fusible metal	68° & 94°	154° & 201°
(according to its composition.)		
	114° Centigrade	or 237° Fahrenheit.
Sulphur	114°	446°
Tin	about 280°	536°
Lead	330°	626°
Zinc	430°	806°
Silver	1000°	1832°
Copper	1060°	1922°
Gold	1250°	2282°
Iron	1550°	2822°
Platinum	1780°	3236°

Melusina, or MÉLUSINE, a fairy of French romance, daughter of the fairy Pressina and Elens, King of Albania. She was the wife of Raymond, Count of Poitiers. Owing to a malignant charm she used to become a serpent from the waist downwards every Saturday. On discovering this, her husband imprisoned her in a dungeon of the castle Lusignan, where traditions of her still survive.

Melville, ANDREW, was born near Montrose in 1545, educated at St. Andrews, and sent to Paris to complete his studies. Thence he passed to Geneva, where he obtained a professorship. In 1574 he returned to Scotland, and was elected

principal of the university of Glasgow, being transferred six years later to St. Mary's College, St. Andrews. He was imprisoned first in the house of the Bishop of London, and then in the Tower, his offence having been a violent attack on the Archbishop of Canterbury at the time of the Hampton Court Conference. In 1611 he was released, but forbidden to return to Scotland. The university of Sedan offered him a professorship, and there he died in 1622.

Melville, GEORGE JOHN WHYTE, was born about 1820, went to Eton, entered the Coldstream Guards, and retired as a captain in 1849. In 1853 he made his *début* in literature with *Digby Grand*. He at once became popular, and some twenty-five works of fiction flowed from his pen before he met his death in the hunting field at the age of 58.

Melville, HENRY DUNDAS, VISCOUNT, was born in 1741, educated in Edinburgh, and admitted to the Scotch bar, becoming Solicitor-General and Lord Advocate. In 1774 he entered Parliament as a supporter of Lord North, but joined Pitt in 1784, being appointed successively to the Board of Control, the Home Office, and War Office. Created Viscount Melville in 1802, he was impeached in 1806 for appropriating public money. Though acquitted, he was made the scapegoat for a rotten system of official corruption, being personally quite innocent, and he retired from public life, dying in 1811.

Melville Island, in the North Polar Sea, lat. 75° N., long. 110° W., was discovered and named by Parry, who wintered there in 1819-20. It is 200 miles long by 130 miles broad, and adjoins Prince Patrick Island, from which it is separated by Kellet Strait, Melville Sound intervening between it and Prince Albert's Land. MELVILLE PENINSULA is of about the same area, but lies farther S. and E., forming the extreme rear of the Gulf of Boothia. A large island of the same name also lies off the coast of north Australia, and was colonised by the British, who founded, but soon abandoned, the settlement of Port Dundas.

Memel, a fortified port, in the district of Königsberg, Prussia, Germany, stands at the mouth of the Dange, just where the Kürische Haff opens into the Baltic Sea, and is the chief centre of the corn, timber, and seed trade of the neighbouring provinces. It was founded in 1252 by the Teutonic Knights, and soon became prosperous, joining the Hanseatic League, and subsequently being annexed by Prussia after a brief possession by Sweden. It has suffered much from war and fire, and was practically rebuilt in 1854. Ship-building, distilling, iron-founding, brewing, and the manufacture of chemicals are chief industries. The Peace of Tilsit was signed on an island in the Niemen close by.

Memling, HANS, flourished as a painter in Bruges during the latter part of the 15th century, but his personal existence is shrouded in mystery. The oldest of his recognised productions is *John the Baptist*, in the Munich Gallery, and that is assigned to 1470. The famous *Last Judgment* at Dantzic was completed three years later and sold to the Medici, but captured by a privateer on its

way south. *The Seven Griefs of Mary*, now at Turin, dates from 1477, and the masterpieces in the Hospital of St. John at Bruges are not earlier than 1479. To the same period belong the *Madonna and Saints* in the Louvre, and the *Virgin and Child* given by Sir J. Donne to Chiswick church. The exact date of his death is unknown, but the archives of Bruges prove that it must have been before 1495.

Memnon, in Greek mythology, the son of Tithonus and Eos, and so connected with Priam, is said to have come from Ethiopia to assist the Trojans, and to have been slain by Achilles in revenge for the death of Antilochus. Modern philologists explain his existence as a mere solar myth; and if the black statue at Thebes, which uttered sounds at dawn, was really a representation of the hero, this interpretation derives strength from the fact. Egyptian tradition, however, assigns it to King Amenophis III. A Memnonium is mentioned as existing at Susa, and similar monuments are referred to in various other places.

Memphis. 1. The Greek name of MENF, the capital of Egypt from its foundation by Menes four to five thousand years B.C., until the 9th Dynasty about 3400. It remained the second city even up to the time of Strabo, though much injured by the invasion of Cambyzes, the foundation of Fostat, and the rise of Alexandria. The final decay set in under the Saracens in the 7th century, but the majestic ruins of temples, tombs, and palaces still extant on the W. bank of the Nile 10 miles S. of Cairo will bear testimony to its pristine greatness for many centuries to come.

2. The capital of Shelby county, Tennessee, U.S.A., stands on the E. bank of the Mississippi, near the confluence of the Wolf river, 450 miles S. of the St. Louis, and 826 miles N. of New Orleans. Occupying a cliff some fifty feet above the water, it is a handsome and now prosperous city. A large trade is done in cotton and other local produce, railway as well as river affording means of transit. The Federals captured the place in 1862 after a sharp naval engagement. In 1873-8-9 the population was decimated by yellow fever.

Menai Strait divides the Isle of Anglesea from the county of Carnarvon, North Wales, and is 14 miles long with a breadth varying from two miles to 200 yards. The depth admits of the passage of small vessels only. Until 1826, when Telford completed his suspension bridge (560 feet in length and 100 feet above the water), travellers proceeding to Holyhead on their way to Ireland were transported by ferry. In 1849-50 Stephenson and Fairbairn built the famous Britannia tubular railway bridge, one of the triumphs of engineering skill; the total span is 1,380 feet.

Menander, the founder of the New Athenian Comedy, was born in 342 B.C., and died at the age of fifty-two. Instead of satirising real personages (as Aristophanes had done) he created types of character illustrating broadly the virtues and vices of mankind. Of his hundred plays only a few scattered lines exist, but we get some idea of his style and method from Terence, who closely

imitated him. Plautus, too, adopted his general scheme of dramatic construction. He was accidentally drowned whilst swimming at the Piræus.

Mencius, or MENG TSEN, the name of a Chinese philosopher who flourished in the 4th century B.C. He is ranked by his countrymen next to Confucius, under whose grandson he studied. His early years were devoted to elucidating the sacred books, and when ripe for the task he undertook to add a fourth volume, which bears his name. Morality is therein expounded in a series of dialogues, which, through the verbiage of Chinese style, reveal originality and boldness. It has been translated into Latin by Stanislas Julien, into French by Pauthier, and into English by Collie.

Mendelssohn, MOSES, was born at Dessau in 1729. In 1755 he published his first book, written jointly with Lessing, the title being *Pope as a Metaphysician*. This was followed by *Letters on the Feelings*, *Letter to Lavater*, *Phædo or the Immortality of the Soul*, *A Code of Jewish Laws and Rites*, and *Jerusalem*, a treatise on the influence of religion. His efforts were chiefly intended to bring about a reconciliation between Christianity and Judaism. When he died in 1786 he left an ample fortune, got in the silk trade, to his many children.

Mendelssohn-Bartholdy, FELIX, grandson of the foregoing, was born at Hamburg in 1809, his father, a wealthy banker, having abjured Judaism and adopted his wife's Italian name. From earliest childhood both he and his sister Fanny showed peculiar sensitiveness to music, and Madame Bartholdy encouraged the tendency. Felix made his first appearance as a pianist in 1817, and he began to compose at the age of twelve. His fame reached Goethe, who invited him to Weimar and accepted the dedication of his first work, viz. three piano quartets. Moscheles and Gherubini heard him, and gave further encouragement. In 1825 he produced an opera in Berlin, which was not a complete success, and in 1826 he had already composed the overture to the *Midsummer Night's Dream*. Three years later he appeared at the Philharmonic Society's concerts in London, where the overture was first played, and after a visit to Italy he returned to England in 1833. His *Stranger and Son*, *Isles of Fingal*, *Walpurgis Nacht*, *Concerto in G Minor*, and *Symphony in A Major* belong to this period. In 1835 he was deeply affected by the loss of his father, and in 1836 he produced his first oratorio, *St. Paul*, at Düsseldorf, bringing it to England, along with his newly-wedded bride, the following summer. From 1838 to 1846 he divided his time between London and Leipzig, holding a directorship in the latter town and an appointment conferred by the king of Prussia. *The Hymn of Praise*, the musical settings of *Antigone* and *Edipus Coloneus*, the *Symphony in A Minor*, *Lauda Sion*, and the overture to *Ruy Blas* were his chief productions during those years. It was for the Birmingham Festival of 1847 that he composed *Elijah*, and he directed the performance. His health now gave way, and, unwilling or unable to rest, although he took a brief holiday in Switzerland, he wrote the *Quartet*

in *F Minor*, sketched out the oratorio of *Christ*, began an opera *Lorelei*, and had two others in view. Paralysis came on quite suddenly and he died at Leipzig in 1847. The composer's centenary was celebrated in 1909 in London, New York, and various continental musical centres.

Mendicancy. [VAGRANTS.]

Mendoza, a province and its capital in the Argentine Confederation, South America. The former has an area of 54,000 square miles, mostly level except in the W., where it runs up to the Andes, which separate it from Chili. It is drained by the river Mendoza, flowing N. for 200 miles and discharging itself into Lake Guanacache. The soil, though sandy, produces wheat, maize, wine, and various fruits. Silver is mined to some extent, and the breeding of mules adds to the general resources. Mendoza, the capital, stands on a high plateau close to the Andes, and 150 miles N.E. of Valparaiso. It is a considerable depôt for trans-continental trade, but has suffered much from earthquakes, especially in 1861.

Mendoza, DIEGO HURTADO DE, was born at Granada in 1503, and, after a distinguished career at Salamanca, was employed by Charles V. as an envoy to Venice, the Council of Trent, and Rome. For six years he commanded the Imperial forces in Tuscany. Under Philip II. he fell into disgrace, and devoted his remaining years to writing the history of the war against the Moors, dying in 1575.

Menhir, a single standing stone. [STANDING STONES.]

Menière's Disease, a disease in which sudden attacks of vertigo or giddiness occur, associated with noises in the ear and usually with some degree of deafness. M. Menière was the first to show that such attacks are due to mischief involving the semicircular canals of the internal ear.

Meningitis, inflammation of the membranes which invest the brain and spinal cord. The most common form of meningitis is that which is associated with tubercular disease, and which particularly affects the membranes at the base of the brain. The early symptoms of tubercular meningitis (acute hydrocephalus, as it is sometimes called) are headache, vomiting, and some degree of fever. In the second stage the patient becomes drowsy, the fever diminishes, the breathing is often irregular, various eye symptoms appear, and what is known as the hydrocephalic cry may be present. In the third stage the patient becomes comatose, and convulsions and paralysis often occur. The disease generally lasts about a fortnight, and the symptoms are so variable that there is sometimes much difficulty in diagnosis. Optic neuritis is frequently present, and may furnish a clue to the nature of the malady; another symptom, to which some importance has been attached, is the "*tache cérébrale*"; this phenomenon, however, may manifest itself quite independently of meningitis. In cases of tubercular meningitis there is often evidence of the deposit of tubercle in other parts of the body. Recovery from the disease is very rare.

Meningitis sometimes occurs altogether independently of tubercular mischief. It may be set up by injury. Cases of simple meningitis sometimes recover. A form of disease, known as epidemic cerebro-spinal-meningitis, has been described as having occurred during the 19th century in France, Ireland, the United States and other countries. This disease is said to be infectious. It is very rarely met with in this country.

Meningocele, a protrusion of a part of the cranial contents through an aperture in the skull, such aperture resulting from defective development of the cranial bones. If the tumour contain brain substance, it is called an encephalocele (q.v.); when the membranes covering the brain alone protrude, it is said to be a meningocele. The most common situations for such protrusions are the occipital region in the middle line of the skull and the root of the nose.

Mennonites, members of a sect which arose in Friesland soon after 1500, and was named after MENNO SIMONS (1492-1561), one of the most prominent professors of their tenets. They advocate baptism upon profession of faith, and refuse to take oaths, or to take any part in war. In the 17th century the sect divided, the Lowland Mennonites separating from the Upland Mennonites or Ammanites, who preserved the original vigour of the sect. The sect is found in the Low Countries, Germany, and Russia, and also (in the largest numbers) in the United States, where several divisions are recognised.

Menominees, North American aborigines, a branch of the Algonquian family, whose hunting-grounds were in the present states of Wisconsin and Michigan; here the name still survives in the river Menominee, flowing to Lake Michigan, and Menominee county in the state of Michigan. The tribe itself, at one time very numerous, is now reduced to about 1,600 persons (1910), the majority being at the Green Bay Agency, where they have made some progress in European culture.

Menopome, either of the two species of Amphibian genus *Menopoma*, from the Mississippi basin, and having the gill-slits persistent. With the Giant Salamander, they form a family. They are ugly and voracious; and such names as "mud-devil" and "hell-bender" show the abhorrence in which they are held.

Menorrhagia, the loss of an excessive quantity of blood at the menstrual periods. This symptom may be due to inflammatory conditions, or to fibroid tumours, polypi, or malignant disease affecting the uterus. It also occurs in cases of incomplete abortion. It may arise, moreover, from certain constitutional defects—as, for example, in scurvy—and is sometimes associated with affection of the heart or liver.

Menschikoff, ALEXANDER DANILOVITCH, the son of a peasant, was born at Moscow in 1672. Peter the Great took him into his service, and gave him his complete confidence. He accompanied the Czar to England and Holland, became governor of Ingria, defeated the Swedes at Kalisch (1706),

received a marshal's bâton for services at Pultowa, but fell into disgrace for restoring Stettin to Prussia. Under Catherine he returned to power, and his daughter married Peter II.; but when that sovereign made Dolgorouki his mistress, he banished his son-in-law, who died in Siberia in 1729.

Menschikoff, ALEXANDER SERGEVITCH, great-grandson of the foregoing, was born in 1789, and early attained the rank of general. In 1825 the Czar Nicholas sent him as envoy to Persia, and he held a military command at the siege of Varna. In 1831 he became governor of Finland and admiral. When the dispute with Turkey as to the protection of the Holy Places grew to a head, Menschikoff was sent to Constantinople as ambassador. He brought about the Crimean War (1854-56), and took command of the Russian forces. After his defeat at the Alma and the death of Nicholas, he was recalled, and lived in retirement until 1869. He was the head of the Old Russian party.

Menstruation. The menstrual discharge usually manifests itself at about 14 or 15 years of age, and continues until the period of the climacteric, which occurs at about the 50th year. The discharge consists of blood, epithelium, and mucus. It lasts, as a rule, from three to six days, and recurs at intervals of a lunar month or thereabouts. The catamenial periods, as they are called, are accompanied, as a rule, by some lumbar pain and by a sense of fatigue; they are related in some way not precisely understood to the discharge of ova from the ovary. The menstrual discharge is absent, as a rule, during pregnancy and the period of lactation.

Mensuration is that branch of applied mathematics which deals with the lengths of lines, areas of surfaces, and volumes of solids, however irregular may be their form. The length of a line is expressed by saying how many units (such as feet, chains, metres) it contains, and it is practically measured by applying the actual unit in the form of a rule or chain to it. The area of a surface is expressed in sums of some unit, such as a square foot, or an acre, but the unit itself does not require to be actually placed on the surface. It is sufficient to measure the lengths of certain lines, and from these the area can be calculated. If we are dealing with a rectangular figure, the area is given by multiplying the lengths of two adjacent sides. The area of a triangle is half the product of the base and height, and the area of any plane figure, such as a field, can be found by dividing it up into suitable triangles, finding their areas and adding the results. If the boundary of the field is curved, certain portions are taken which will approximate to parts of a circle, an ellipse, or other such curves, and calculating the areas by using the known formulæ for those figures. The volumes of solids are found by the application of similar rules. All the rules and formulæ used in mensuration can be proved by geometry, etc., but it is not necessary to know the proof in order to use the rules. Since these rules are few and simple, mensuration is an easy branch of practical science.

Menthol. [CAMPHORS.]

Mentone (Fr. MENTON) is a town in the department of the Alpes Maritimes, France, 12 miles N.E. of Nice by railway, on the shore of the Mediterranean. It still retains among all but Frenchmen its Italian name, having only been bought by France from Monaco in 1860, before which date the place had acquired considerable repute as a resort for consumptive patients. Sheltered by the Maritime Alps on the N. and by the Tête du Chien on the W. from cold winds, it enjoys a mild and slightly relaxing climate. Considerable damage was done by an earthquake in 1887.

Menzel, WOLFGANG (1798–1873), the son of a well-to-do physician, was born at Waldenburg, Silesia. At Jena and at Bönn, where he became a student, his democratic views were so pronounced that he had to seek refuge in Switzerland. He did not confine his discontent to politics, but made a violent onslaught upon Goethe and his followers. Many works came from his pen on history, literature, and criticism, besides some verse. In 1825 he settled at Stuttgart as editor of the *Litteraturblatt*. His last utterances dealt with the war of 1866 and the attitude of France, a country which he cordially hated.

Mephistopheles. [SATAN.]

Mercantile System, in political economy the system aimed at by Colbert in France, and numerous followers in various countries, of establishing an excess in the value of exports over that of imports, the difference, called "the balance of trade" (q.v.), being adjusted by the annual importation of specie, the amount of which measures the advantages of trade. This theory, unless received with important modifications, involves the fallacy that gold and silver alone are wealth. Its grounds, however, were chiefly political, a large reserve of specie being thought necessary in case of war—a view exploded by Adam Smith.

Mercator (Latinised form of KREMER), GERHARD, geographer and map-maker, born in 1512 at Rupelmonde, in Flanders, was cosmographer to the Duke of Cleves, and died at Duisburg in 1594. He is particularly known in consequence of his invention, in 1569, of the principle which is now called Mercator's projection. In this the surface of the globe, or any part of it, is represented on a map or chart, not as spherical but as plane, and the parallels of latitude and meridians of longitude are denoted by straight, instead of by curved, lines. The end is attained, of course, by varying the scale in different regions, but, as the regions which have to be most magnified—namely, the polar ones—are those which are least visited, the exaggeration does not materially affect the value of the system. It is employed universally in sea charts, also in many of the best maps.

Mercenaries, professional soldiers, who enter a foreign service for pay, originally so called to distinguish them from troops who followed their feudal lords. The most noted associations of mercenaries are the Varangians of Constantinople in the 10th century, the Normans in Italy and Sicily in the 11th century, the company of Sir John Hawkwood in Italy in

the 14th century, the Scotch and English companies during the Thirty Years' War, and the Swiss.

Mercia, that part of Saxon England which bordered on the Welsh Marches; hence its name. The kingdom was founded in the 6th century, and at first covered little more than Staffordshire. Penda, its first great king, not only changed it from a mass of independent settlements into one great kingdom, but even for a time checked the progress of Christianity. His nephew, Wulfhere, re-established the position of Mercia, which had been lost at Penda's death, but submitted to Christianity. During the 8th century under Æthelbald, Offa, and Cenwulf, it was the most powerful of the Saxon kingdoms; but after the battle of Ellendun (823) it finally succumbed to Wessex, though there was a revolt under Edwy, and a kind of semi-independence followed its establishment by Cnut as one of the four earldoms.

Mercurial Pendulum, a special form of pendulum, invented by Graham, compensated for temperature variations by means of a reservoir of mercury that takes the place of the ordinary pendulum bob. [PENDULUM.]

Mercury, in astronomy, is the smallest planet except the planetoids, in the solar system, and the one nearest the sun. It is never seen for more than two hours before sunrise or after sunset, and is not always visible then; but when it does appear, it is extremely brilliant. It was considered to have no spots on its surface, but the discovery of a very faint one during the 19th century enabled the length of its day to be calculated as 24 hours 5½ minutes. It takes 88 days to travel round the sun, its mean distance from that body being 36,000,000 miles. Even when it is most distant the sun appears four and a half times as big to it as it does to us, and when the two are at their nearest, this small planet gets ten times as much light and heat as we do. Forms of life, if any, must, therefore, be very different from the ones we know, unless the intense heat is tempered by an atmosphere of some kind. Mercury has no satellite, so its density has been calculated from its supposed effect on a passing comet. It is believed to be one-sixth greater than the density of the earth, and its gravity is supposed to be such that a pound would weigh about 7 oz. there, rendering motion of all kinds extremely easy. The diameter of Mercury is 3,030 miles, and its axis is by some supposed to be much inclined to the plane of its orbit. It is, however, so small and difficult to observe, that comparatively little is known of it, its true shape, and the position of its axis, with its effects on its seasons, being matters of conjecture only.

Mercury is a metallic element which, though not known since such ancient times as iron and some of the other metals, has still been known since some centuries B.C., and from its remarkable properties attracted the attention of the earlier alchemists. It exists native to a slight extent, occurring as small globules in certain of its ores. The chief ore is the sulphide, cinnabar (q.v.), which is found largely in Almaden, Idria, Mexico, and

California. The preparation of the metal from this source is mentioned in the writings of Theophrastus and Dioscorides, to whom mercury was known as *liquid silver* and *water silver*. The Romans named it similarly *hydrargyrum* or *argentum vivum*. The alchemists believed mercury to be a constituent of all metals, and its compounds were by them well examined, and many employed medicinally. From cinnabar it is obtained by distillation in suitable furnaces, either alone or mixed with lime. The vapours of mercury pass off, and are condensed in receivers arranged for the purpose, and the metal is afterwards purified by redistillation. It is a silver-white liquid metal, being the only metal and, with exception of bromine, the only element, liquid at ordinary temperatures. At about -40° C. (or F.) it freezes to a malleable white mass. It has the high specific gravity of 13.595, so that iron, lead, and all the common metals, except gold, can float upon it. It boils at about 360° C., but gives off vapour at much lower temperatures, and can be readily distilled *in vacuo*. Its atomic weight is 200, and it is represented by the symbol Hg (hydrargyrum). Mercury forms two oxides—mercurous, or black oxide (Hg_2O), and mercuric oxide (HgO) or red precipitate. This latter has been long known, and is used in medicine and frequently in the chemical laboratory. From these oxides two series of salts are obtainable, mercurous and mercuric salts. The chlorides, known respectively as *calomel* and *corrosive sublimate* (see below), are the most important of the mercury salts, but others are also in general use. Mercuric iodide is remarkable inasmuch as it exists in two forms: (1) a scarlet, the more stable form, which, on heating, passes into a (2) yellow variety, which, upon mechanical disturbance, immediately changes back to the red. The metal itself is very largely employed in chemical and physical work; it is extensively used for the preparation of barometers and thermometers, for which its high specific gravity, its good conductivity of heat, small specific heat, and long range of liquidity render it specially adapted. It is much used for preparation of mirrors, manufacture of its salts, and amalgams, and for the extraction of gold and silver in certain metallurgical processes.

Mercury and its salts are largely used in medicine. Metallic mercury is administered in the form of "blue pill" and of "grey powder," either as a purgative or in the treatment of syphilis; or again "blue ointment" may be applied by inunction to produce the specific action of mercury on the system. The perchloride of mercury (corrosive sublimate) is extremely poisonous, and is a powerful disinfectant. In solution (of strength 1 in 1,000) it is much used for its germicidal properties. It is administered sometimes internally in minute doses. Subchloride of mercury (calomel) is a useful purgative, and was largely used in former days in combination with opium in the treatment of inflammatory conditions. "Black wash," which contains the black oxide, and "yellow wash," which contains the yellow oxide, are employed as external applications. The oleate of mercury is useful in syphilis and in certain skin affections, and the white precipitate ointment is a valuable parasiticide. The acid nitrate of mercury

is used as a caustic. Great care is necessary in the administration of mercury internally. The persalts are much more actively poisonous than the subsalts. The solution of corrosive sublimate has sometimes produced poisoning through being swallowed by mistake. White of egg is given in such cases, as the mercurial salt is precipitated by albumen. When small doses of mercury are administered for a long period the symptoms of "mercurialism" are produced; these are profuse salivation, swelling and ulceration of the gums, dyspepsia, anæmia, and muscular tremors and paralysis.

Meredith, GEORGE (1828–1909), one of the foremost English novelists of the period. Born in Hampshire, educated in Germany, and was decorated with the Order of Merit founded in 1902 by the late Edward VII. In 1851 he published a volume of *Poems*, and four years later, his first prose work, *The Shaving of Shagpat*, a series of stories, half-imitation, half-burlesque, of the *Arabian Nights*. In 1857 German romance was treated in a similar manner in his *Farina*. In 1859 appeared *The Ordeal of Richard Feverel*, and in 1879 *The Egoist*, and many others meantime. *The Tragic Comedians* (1881) was founded on the life-story of Lassalle. It was succeeded by *Diana of the Crossways* (1885), *One of Our Conquerors* (1891), *Lord Ormont and his Aminta* (1894), and *The Amazing Marriage* (1895). The best of Meredith's verse is contained in *Modern Love* (50 sonnets, 1862), *Poems and Lyrics of the Joy of Earth* (1883), *Ballads and Poems of Tragic Life* (1887), *A Reading of Earth* (1888), *The Empty Purse* (1892), and *Odes in Contribution to the Song of French History* (1898), *Selected Poems* (1900); *A Reading of Life* (1901); *Short Stories* (1902).

Merganser, any bird of the genus *Mergus*, of the duck family, with six species from the Palearctic and Nearctic regions, Brazil, and the Auckland Islands. The bill is straight and slender, hooked at the tip, and strongly toothed along the edges. Besides the Goosander (q.v.), the Red-breasted Merganser (*M. serrator*) breeds in Scotland, the Smew (*M. albellus*), sometimes called the Nun from its black-and-white plumage, visits Britain in severe winters, and the Hooded Merganser (*M. oculatus*) is a rarer visitor. *M. brasiliensis* is from South America, and *M. australis* from the Auckland Islands.

Mericaip (from the Greek *meros*, "a part;" *karpos*, a "fruit") is a useful general term applied in botany to the parts, otherwise termed *nutlets*, or *cocci*, into which some syncarpous fruits (schizocarps) split when ripe, without exposing the seed. In the Umbelliferae (q.v.), for instance, the cremocarp splits into two mericaips (of which the so-called "caraway-seed" is a familiar example), each of which is a carpel. In Boraginaceae and Labiatae (q.v.), on the other hand, the fruit (regma) splits into four, each of which is half a carpel. [FRUIT.]

Merida. 1. An ancient town in Spain, stands on the Guadiana, 36 miles E. of Badajoz. As Augusta Emerita it was the capital of the Roman province of Lusitania. Memorials of its history are a

Moorish palace, and Roman remains, including a fine bridge, and the Arch of Santiago, both of which were built by Trajan.

2. The chief town of Yucatan, a province of Mexico, founded in 1542. It has a cathedral, university, public library, and conservatory of music.

3. The capital of the state of Los Andes, Venezuela, stands more than 5,000 feet above the level of the sea. It is a university and cathedral city, and manufactures carpets. In 1812 an earthquake did great damage.

Meridian, in astronomy, is the great circle in which any plane containing the earth's axis cuts the celestial sphere. The meridian of any place passes through the zenith of that place, and cuts the horizon in the *meridian line*. This line gives the direction of north or south. When the sun crosses the meridian of any place, it is noon there. Stars are higher in the heavens when they reach the meridian than at other parts of their path, and are more accurately observed then, since the distorting effect of refraction is in that position as little as possible. These observations are made with *meridian circles*.

Mérimée, PROSPER (1803-70), a distinguished French man of letters, was born at Paris. He entered the public service, and in 1831 was appointed inspector-general of historic monuments. A personal friend of the mother of the Empress Eugénie, he was much attached to the Bonapartes, and became chief of the Ministry of Marine (1853), and president of the Commission for the Reorganisation of the Imperial Library (1858), besides being employed diplomatically. He was admitted to the Académie Française in 1844, and was a leading member of the Académie des Inscriptions. He died at Cannes after a lingering illness. His earliest works were a pretended Spanish comedy, and a collection of pretended Illyrian songs (*Guzla*). Chief among his historical works were *Un Chronique de Charles IX.* (1829), *En Corse* (1840), *Monuments Historiques* (1843), and *Les Faux Démétrius* (1853). His fame as a writer chiefly rests upon his short stories, *Contes et Nouvelles* (1846), *Nouvelles* (1852), and *Dernières Nouvelles* (1874). His *Lettres à une Inconnue*, a charming and interesting autobiographical collection, were published in 1873, and succeeded in 1875 by *Lettres à une autre Inconnue*.

Merioneth (MEIRIONYDD), a county in north Wales, bounded on the north by Carnarvon and Denbigh, on the south and east by Montgomery and Denbigh, and on the west by Cardigan Bay. It is 45 miles long, and has an area of 523,708 acres. Its surface is very mountainous, and the county contains the peaks of Cader Idris, Aran Mowddwy, Arenig-Fawr, and several others of over 2,000 feet. The scenery in the valleys and on the sea-coast is very fine. There are several lakes, the chief of which is that of Bala, called in Welsh Llyn Tegid ("the fair lake"). Barmouth and Aberdovey have good harbours, but the coast is generally dangerous, owing to shoals and sandbanks. The climate varies, according to altitude, from cold to mild, and the soil is poor. Near

Festiniog there are large slate quarries, and at Dolgelly woollengoods are made. The county returns one member to Parliament. Pop. (1901), 64,248

Meristem (from the Gk. *meristos*, "divisible") is a general term in vegetable histology (q.v.) for all tissues in which the cells, by retaining their protoplasm, are capable of undergoing cell-division.

Merivale, HERMAN (1806-74), was for some time fellow of Balliol College, Oxford, and professor of political economy in the university. He was afterwards successively permanent Under-Secretary for the Colonies and for India. He was author of *Historical Studies*, and continued Parke's *Life of Sir P. Francis*. CHARLES MERIVALE, his brother, born 1808, became successively fellow and tutor of St. John's College, Cambridge, Hulsean and Boyle lecturer, chaplain to the Speaker, and Dean of Ely (1869). His chief works were *The Fall of the Roman Republic* (1853), a *History of the Romans under the Empire* (1859-62, in eight volumes), and a *General History of Rome* (1873). He died in 1893.

Merlin, the magician and sage of the Arthurian legends, is placed by Geoffrey of Monmouth in the 5th century. He is said to have been the son of a demon and a Welsh princess, and to have gained the power after his baptism of working miracles. In French literature his story is told by Wace and Robert de Borrou. Merlin's *Prophecies* appeared in French, English, and Latin in the 16th century. A Scottish Merlin is said to have lived in the 6th century; while escaping from some enemies across the Tweed at Drummelzier, where his grave is still shown, he was impaled on a hidden stake. His *Prophecies*, published at Edinburgh in 1615, embody those of the Cambrian Merlin. The latter is a character in Tennyson's *Idylls of the King*.

Mermaid, a mythical being represented as having the body of a woman and the tail of a fish, and living in the sea. The typical mermaiden was beautiful; like the Lorelei, she was generally occupied in combing her long hair, and in her left hand she carried a mirror. These creatures figure largely in folk-lore, and were supposed to be capable of feeling or feigning affection for, and forming connections with, men, sometimes on shore, sometimes in caves in the depths of the sea. Similar stories are told of mermen and their relations to women. In most cases these connections ended badly for the human partner. The origin of the myth seems to lie in the worship of nature-forces, and it was just as natural to imagine a water-spirit with the tail of a fish as a satyr or faun with the hind-legs of a goat. Cuvier thought that the ancients took their notions of mermaids from the manatees and dugongs. It would probably be more correct to say that the observation of these animals by moderns strengthened the old superstition, and was no more the cause of it than any of the fabrications of monkey and fish-skin formerly exhibited as mermaids at village fairs.

Merovingians. [FRANCE.]

Merseburg, a town in Prussian Saxony, on the right bank of the Saale, 60 miles S.S.E. of

Magdeburg, formerly the residence of the dukes of Sachsen-Merseburg. It has a fine cathedral, the choir of which dates from the 11th century, and a 15th-century castle. Merseburg has been the scene of two battles: Henry the Fowler defeated the Hungarians there in 934, and Rudolf of Swabia (whose bronze effigy is in the cathedral) encountered defeat and death from Henry IV. in 1080.

Mersey, THE RIVER, is formed from the junction of the Goyt and Etherow in the north-east of Cheshire. During the greater part of its course of 68 miles it forms the boundary between Lancashire and Cheshire. Its chief affluent is the Irwell, from the point of its junction with which stream it is navigable to the mouth. Navigation is aided by sea-walls and good pilotage. The estuary is entered on the Cheshire side by the Manchester ship-canal, and a tunnel connecting Liverpool and Birkenhead was made under the water in 1886.

Merthyr Tydvil, a town in Glamorganshire, stands on the Taff, at the apex of a triangle of which Swansea and Cardiff are the points at the base. It is the centre of the South Wales iron and steel manufacture and of the Glamorganshire coal-field. The growth of the place dates entirely from the manufacturing era, and it has no buildings with any pretence to beauty, while its sanitary arrangements were for a long time far from perfect. The parliamentary borough, which was formed in 1867, includes Aberdare and other environs, and now returns two members. Pop. (1909), 77,219

Merv (the ancient *Margiana*), an oasis, 60 miles long and 40 broad, situated between Persia and Bokhara. A town built in its midst by Alexander the Great became afterwards the capital of the Arab province of Khorassan. After attaining a high degree of splendour under the Seljuk Turks it was taken by the Mongols in 1221. The Persians held it during three centuries, but in 1787 it fell to the Emir of Bokhara. The oasis of Merv next became the property of the Turkomans, who, after holding it nearly 30 years, were obliged to see it seized by the Russians in 1883. The district is well-watered by the river Murghab, and yields wheat and other crops. Horses, camels, and sheep are well pastured; the men work in silver, and the women weave. The Russians opened in 1886 a railway connecting Merv with Michailovsk, a port on the Caspian Sea,

Méryon, CHARLES (1821-68), a great French etcher, was the son of an English physician and a French ballet-dancer. After serving in the French navy and sailing round the world, he settled down to an artistic career in Paris in 1846. Between 1850 and 1854 he produced his *Stryge*, *Rue des Mauvais Garçons*, and *Abside de Notre-Dame*, works which are now held by connoisseurs to rank with those of Dürer and Rembrandt. In his lifetime, however, Méryon's talents were not recognised; after recovering once, he had finally to be placed in the lunatic asylum at Charenton, where he died.

Mesentery. The radial muscular plate which occurs in the Anthozoa (q.v.). They support the digestive tube and the reproductive organs: they divide the body-cavity into a number of chambers

or loculi. In the human body the abdominal contents are enveloped in the folds of the great serous membrane known as the peritoneum. The folds of peritoneum which envelop the small intestine pass backwards to become continuous with the rest of the peritoneum in the neighbourhood of the spinal column, and the two layers of serous membrane contain the blood-vessels, nerves, and lymph vessels, which are transmitted to the small intestines. The whole connecting structure serves as a kind of ligament which tethers the intestines to the vertebral column, and is called the mesentery.

Meshed, or MASHHAD, an important town in the north-east of Persia. It has a splendid mosque built over the tomb of Imam Riza, and is the Mecca of the Shiite Moslems, or followers of Ali. As such it is visited every year by something like 700,000 pilgrims. It is also an important trade centre, the greater part of the trade being with Russia and India. Haroun-al-Raschid and Firdausi were buried near Meshed.

Mesmer, ANTON FRIEDRICH (1733-1815), author of the doctrine of animal magnetism, was born at Meersburg, near Constance. He took the degree of doctor of medicine at Vienna in 1766, his thesis being *De planetarum influxu*. In 1775 he published a *Letter to a Foreign Doctor* (Storck), in which he maintained that all bodies are susceptible to the communication of the magnetic fluid, which penetrates everything. He experimented on a patient, convinced some doctors, and created a rage for magnetism in Paris; but the refusal of a pension in exchange for the revelation of his discovery aroused suspicion, and in 1785 a commission, consisting among others of Franklin and Lavoisier, pronounced his claims to be spurious.

Mesoblast, the layer in an embryo which occurs between the external layer or *epiblast* and the internal layer or *hypoblast*.

Mesocarp, the middle tissue of a fruit, consisting typically of the mesophyll (q.v.) of the carpellary leaf or leaves. It is often fleshy and edible, as in the plums, peaches, etc., and it is then sometimes called the *sarcocarp* (from the Greek *sarx*, "flesh"); or it may be stringy, as in the almond; or even fibrous, as in the coconut. The term can only be employed with morphological accuracy in speaking of such superior fruits as these, and not of inferior fruits, such as the apple. [FRUIT.]

Mesogloea, the soft, gelatinous material between the endoderm and ectoderm in Coelenterata (q.v.). It is the equivalent of mesoblast in higher animals.

Mesophyll (from the Greek *mesos*, "middle;" *phyllon*, "a leaf") is the cellular tissue in the interior of the leaf (q.v.). In the ordinary horizontal leaves of flowering plants it is usually divided into two parts—(1) the *palisade tissue*, one or two layers of closely-packed, vertical, prismatic cells, rich in chlorophyll, and acting as the *assimilating tissue*, just below the upper epidermis; and (2) the *spongy mesophyll*, loosely-arranged cells, sometimes stellate, with large intercellular spaces communicating with the stomata (q.v.) in the lower epidermis. This

paler-coloured tissue is traversed by the veins of the leaf and acts mainly as the *transpiring tissue*.

Mesopotamia ("the district between the rivers"), the Biblical Aram-Naharayim, or Padan-Aram—that is, the country between the Euphrates and the Tigris. It is, of course, only a geographical expression, and is used somewhat loosely. Mesopotamia covers over 50,000 square miles of sandy but fertile soil, from which cereals, tobacco, rice, and many fruits are raised. The climate varies from extreme heat in summer to a degree of cold rare in corresponding latitudes. The inhabitants are Arabs and Kurds, who are more or less nomadic in their habits. The country contains the historic cities of Mosul (the ancient Nineveh), Edessa, Diarbekr or Amid, Nisibis, Nicephorium, and Thapsacus. Bagdad (q.v.) lies beyond to the south-east.

Mesozoic, or SECONDARY, the name applied to the great group of rocks between the Palæozoic (q.v.) and the Cainozoic or Tertiary (q.v.), because the dominant types of living organisms preserved in them are intermediate between the types now existing and those so largely dissimilar which characterise the older sedimentary rocks. Among plants, cycads, conifers, and, towards its close, angiosperms, characterise this era; among animals, the Hexacoralla, abundant sea-urchins (*Eu-echinoida*), brachiopods abundant in species but of few genera, oysters, scallops, and numerous other bivalves, the cephalopodous Ammonites and Belemnites, homocercal fish (teleostean at the close of the period) and the enormous variety and size of reptiles, including crocodiles, turtles, and lizards, in addition to the great extinct groups, such as the Ichthyosauria, Plesiosauria, Pterosauria, and Dinosauria. The Mesozoic group comprises the three great systems, the Triassic, Jurassic, and Cretaceous, which are described separately.

Messalina, VALERIA, wife of the Emperor Claudius, was daughter of Valerius Messala Barbatus. She was one of the wickedest women of antiquity, being notorious for her licentiousness, her cruelty, and her avarice. After she had insulted Claudius by marrying Silius, he was persuaded to order her execution, which was carried out by a prætorian tribune in the gardens of Lucullus (48 A.D.)

Messenia was the western part of the Peloponnesus. The country is fertile, with a beautiful climate. Its richness and prosperity excited the cupidity of the Spartans, who, after three wars, succeeded in taking possession of it. Many of the inhabitants expatriated themselves and went to Sicily, where they founded Messana (the modern Messina). When Epaminondas, the Theban, had defeated Sparta he brought back the Messenians to their country, where they remained independent till conquered by Rome. The province of Messenia, in modern Greece, is thinly-peopled and very backward.

Messiah, MESSIAS, "the Anointed" (Heb. *Mashiach*), the title by which the Hebrew prophets designated the deliverer whom the Jews expected God to send to restore their race to power and prosperity. Christians identify the Messiah with

Jesus, but many Jews still look for his advent. See Daniel ix. 25, 26.

Messina, the second town of Sicily, is situated on the north-east coast of the island on the Straits of Messina. It was originally called Zancle ("sickle") from the shape of its harbour. It was for some time under Carthaginian rule, but in 241 B.C. became a Roman possession. When the empire was divided, it was included in the eastern portion. It was taken by the Saracens in 831, and was the first conquest of Roger the Norman in 1061. The city next came under the sway of the German emperors, and, after a short period of French rule, was for six centuries (1282–1713) a Spanish possession. Messina was the scene of the Sicilian Vespers in 1282, of a plague in 1743, and of a terrible earthquake in 1783. It was bombarded for three days in 1848 by the Neapolitans, and held out obstinately against the Sardinians in 1861. The fine harbour of Messina made it an important port from the earliest days. It is estimated that more than 3,000 vessels enter the port every year. Fruits, wheat, wines, and oil are exported, and the inhabitants work in the coral and make up silk goods. Messina has a university, founded by the Jesuits in the 16th century, and is an archiepiscopal see. The cathedral was begun in 1098, but has suffered much and been continually rebuilt, so that it exhibits the utmost diversity of styles. There are several other handsome buildings.

Metabolism, or METASTASIS, the *stoffwechsel* of German physiological writers, is a general name for all the changes which take place within an organism from the first taking in of food to its resolution into the products of excretion or decomposition. It thus includes assimilation and protoplasmic growth, the chemical processes which generate bodily energy and build up new structures, and the breaking up of complex organic substances into such simple substances as water, urea, ammonia, or carbon-dioxide. These processes of *constructive metabolism*, *anabolism* (q.v.), or life, and of *destructive metabolism*, *katabolism* (q.v.), or death, are constantly going on side by side within the body, and there is some evidence of their alternation in a momentarily explosive manner in the protoplasm of each living cell.

Metallurgy. Although metallurgical operations have been performed for thousands of years, yet metallurgy—i.e. the separation of metals from their ores—cannot be said to have existed as a science until the 19th century. The earliest writings show the authors to have been possessed of a certain amount of crude metallurgical knowledge, and the Greeks and Romans were acquainted with many processes for the smelting of ores and the production of metals. Thus gold, silver, lead, copper, iron, tin, mercury, and some of the alloys of these metals were all produced before the commencement of the present era. During the alchemistic period some new metals and many new facts were discovered, but, although improvements in the methods of extracting gold and silver were invented, little advance was made in the general methods of metallurgy. Agricola and Libavius in

the 15th and 16th centuries did more than any others in this branch of scientific inquiry. In the 19th century, however, the processes employed became first subjected to systematic study, and the scientific facts and principles underlying the various industrial and manufacturing methods first examined; and with the study were born the great number of processes and operations employed now for numerous metallurgical purposes. As, however, each metal demands separate and distinct methods of treatment for its extraction, it is impossible to describe any general methods. They may, however, be roughly divided into (1) dry extraction, (2) wet extraction, (3) amalgamation, and (4) electrolytic processes. Of these the first is the most important, and includes all those cases where the metal is extracted from its ores by heating the ore, mixed, if necessary, with other material, *flux*, in suitably-arranged furnaces. The substances combined with the metal then oxidise and pass away as fumes—*e.g.* sulphur, arsenic, etc., or combine with the flux and form a slag, which separates from the metal—*e.g.* silica. The metal is thus usually obtained in the molten state, and is run out of the furnace or in some cases may be distilled off and condensed in suitable receivers—*e.g.* mercury, zinc. *Wet processes* are those in which the metal is separated by the use of suitable liquid solvents, *e.g.* acids, alkalis, salt solutions, by means of which the ore is dissolved, and from which solution the metal is afterwards separated. The *amalgamation processes* should really come under the preceding class. They are used only in the case of gold and silver. Mercury is added to the crushed ore and well incorporated. If the gold ore is not present in the free state, other substances are added to liberate it. The mercury forms a liquid amalgam with the precious metal; this is collected, and the mercury driven off by heat. *Electrolytic processes* are of comparatively recent date, but are becoming more important in very many branches of the science, the metal being separated by the electrolysis (q.v.) of a solution of its ore. Before being subjected to any of the above modes of extraction, however, the ore has usually to be subjected to some preliminary treatment. As it comes from the mine it is sometimes first assorted by hand-picking, the worthless stones being rejected. The ore is next reduced by means of *stamps* or *rolls* to a size suitable for the further treatment. The degree of fineness varies considerably. In the case of tin ores it is extremely fine, while for lead ores particles which pass through an $\frac{1}{8}$ -inch sieve are considered to be sufficiently small. The crushed ore is spread upon a slightly sloping floor and exposed to the action of a broad shallow stream of water, which washes off the worthless *gangue*, or matrix in which the ore is imbedded, leaving behind the concentrated richer portion of the ore. Many different methods and machines are employed for this concentration, but all depend on the fact that the ore itself is specifically heavier than the gangue, which is hence first removed by washing. After drying, the ore is usually ready for the furnace, where it is to be next operated upon; for its further treatment reference should be made to the articles on the different metals themselves.

Metals. The division of the elements into the two categories, the metals and the non-metals, is one which, though not scientific or rigid, is yet so convenient as to make it commonly adopted. Of the metals now known, six were familiar to the ancients and are mentioned in the scriptural writings. These are gold, silver, tin, copper, lead, and iron. Other metals became gradually added to the list, and at the commencement of the 19th century the number of metals known to chemists was raised to seventeen; while, at its close, this number was more than trebled. The first definition of the term was given by Geber in the 8th century, who regarded fusibility and malleability as the essential characteristics. According to his view also of the nature of these substances, they all consisted of varying quantities of mercury and sulphur, and he and the following alchemists were therefore great believers in the possibility of transmuting the common metals into gold. When the brittle metals, antimony, etc., were discovered, they were regarded as only semimetallic or pseudometallic, being not malleable, and mercury was not regarded as a metal until it had been solidified. In the 18th century the distinction between the metals and semimetals was lost, and the characteristic properties of metals were opacity, lustre, and high specific gravity. The last of these qualities had to be given up as non-essential when sodium and other light metals were discovered; while the first two have also disappeared, as many non-metals possess a metallic lustre and all are transparent if sufficiently thin. The 18th-century idea of the chemical nature was that they all consisted of a metallic calx united with phlogiston [PHLOGISTON], and it was left to Lavoisier to demonstrate their elementary nature. At present a complete definition to include all metals is difficult. They are best characterised as being elements the oxides or at least the lower oxides of which form bases capable of neutralising acids with the formation of salts.

Metamorphism is a term employed in geology for the various changes in texture which certain rocks undergo subsequent to consolidation. These rocks, which are termed *metamorphic*, may be originally either aqueous or igneous. The alteration they have undergone may consist merely in a rearrangement of their particles, or may involve partial or complete crystallisation or even the introduction of new substances into the rock. The production of cleavage (q.v.), by which clay is converted into clay-slate; and of foliation, by which granite may be changed into gneiss (q.v.), or diorite into hornblende-schist, are examples of the first of these modes of change. Marmorosis, *i.e.* the conversion of chalk into marble (q.v.); and the formation of *spotted slates* by the development of crystals of andalusite, chiastolite, etc., are examples of the second mode; and dolomitisation, *i.e.* the conversion of ordinary limestone into magnesian limestone, exemplifies the third mode of change. Such metamorphism as the first or second modes may be the result of pressure and the heat that pressure generates. Shale (q.v.) seems to have originated in part from vertical pressure, and the

direction of cleavage-planes points to cleavage as being generally the result of such tangential or horizontal thrust as would come in the general cooling of the earth's crust. Foliation and schistosity may be merely rearrangements of crystalline particles also due to such lateral pressure; but the development of scattered crystals in slate, and the formation of some marble from chalk, is often obviously the result, as at Rathlin Island, of the thrusting of molten igneous rock through rock not previously crystalline. Heat, however produced, seems sometimes to have reheated igneous rocks to such a point as to permit a rearrangement of crystals without actual fusion. The introduction of new substances into a rock cannot be explained by mere pressure or heat, but must be due to percolating water, mineral solutions or vapours, which sometimes accompany the thrusting in of molten igneous rock. Many metamorphic rocks, indeed, show signs of the combined action of all the various agents of metamorphism.

Metamorphosis, the change which many animals undergo during development, when an entirely different form is assumed; the butterfly is an example.

Metaphor, a rhetorical figure of speech by which the terms for expressing one idea are transferred in consideration of some analogy or similitude to the expression of another idea. The substitution may take place in the case of substantives, adjectives, verbs, adverbs, or phrases, and even of whole sentences or passages. Most ordinary vocabularies consist to a very large extent of expressions which once were metaphors. For instance an *expression* is a "squeezing out."

Metaphysics. This term, which originally meant "first philosophy," or the study of first principles, is due to Aristotle's treatises on this subject having been placed *after his physical treatises, meta ta physika*. The term now embraces the study of ontology and such psychology as is transcendental, *i.e.* goes beyond conclusions derived from experience, and also any studies pursued on transcendental methods. This use is partly due to the title *meta ta physika* being wrongly supposed to mean "beyond physics," "transcending physics."

Metastasio, PIERO BUONAVENTURA (1698-1782), an Italian poet much esteemed in the 18th century, was born at Rome of poor parents. His father's name was Trapassi; the name was Græcised by the poet's early patron, Gravina, the jurist. Metastasio made his reputation by a birthday ode, *The Gardens of the Hesperides*, written for the Empress Elizabeth Christina. This brought him to the notice of Bulgarini the singer, for whom he wrote his chief pieces, *La Semiramide*, *L'Artaserse*, *La Didone Abbandonata*. She left him her fortune, his claim to which the poet generously decided to forego in favour of her husband. In 1730 Metastasio was invited to Vienna and given the post of "poeta cesareo" by the Emperor Charles VI. Here he died, leaving a large fortune.

Metatheria. [MARSUPIALS.]

Metazoa, animals in which the cells are differentiated, *i.e.* all animals above the Protozoa (q.v.). [ANIMAL KINGDOM.]

Metchnikoff, ELIE. A Russian by birth, Prof. Metchnikoff was educated at Kharkoff, his birthplace (1845), and later at Giessen and Munich. In 1870 he was made Professor of Zoology at Odessa, from which he resigned twelve years later in order to devote himself to private scientific research, largely in connection with the anatomy of the invertebrates. In 1866 he published *Embryologische Studien an Insecten*, and during the next ten years other works on the same lines. His later works include "The Nature of Man," 1903; "Immunity in Infective Diseases," 1906; "The Prolongation of Human Life," 1907. In 1908 he shared the annual Nobel prize (medicine) with Dr. Erlich of Berlin. At the present time he is Professor at the Pasteur Institute, Paris, also being *Membre de l'Académie de Médecine*, and foreign member of the Royal Society of London.

Metellus. The name of an ancient Roman family of the Cæcilian clan. (1) LUCIUS CÆCILIUS was twice consul, and in 224 B.C. dictator. He won the battle of Panormus in the first Punic War, and in 241 B.C., when the temple of Vesta was on fire, saved the Palladium. For the latter service his statue was erected in the Capitol. He died in 221 B.C. (2) QUINTUS CÆCILIUS, surnamed NUMIDICUS, was the ablest of his family. Consul in 109 B.C., he had Numidia as his province, and carried on the war against Jugurtha. He headed the aristocratic party at Rome against Marius and Saturninus, and was expelled the senate in 100 and exiled to Rhodes. On his return to Rome he was received with enthusiasm.

Metempsychosis. [TRANSMIGRATION.]

Meteorology is a science which treats of atmospheric phenomena. A more general consideration is indicated by the term *weather*. Aristotle may be said to have been the first meteorologist, but nothing exact was done till the invention of the thermometer and barometer. In 1817 Humboldt's "isothermal lines" divided the globe into areas of equal temperature, and gave a first idea of the arrangement of the climates of the earth. This work on the temperature of different localities has been carried on ever since; but not till 1868 was anything definite done with regard to the pressure of the air and the connection between it and the prevailing winds of any locality. Next followed charts of the rainfall of different districts, the connection between it and the prevailing winds and contour of the districts being at once seen. Weather maps now occur daily in our newspapers, but they first appeared in 1858 in accordance with a suggestion of Le Verrier's. These weather maps, drawn up in different places, have been of immense practical advantage in enabling storms to be predicted. The study of meteorology covers the registration of dew-point, description of clouds and thunderstorms, alteration of the position of a compass-needle, connection between magnetic disturbances and solar changes, and occurrence of



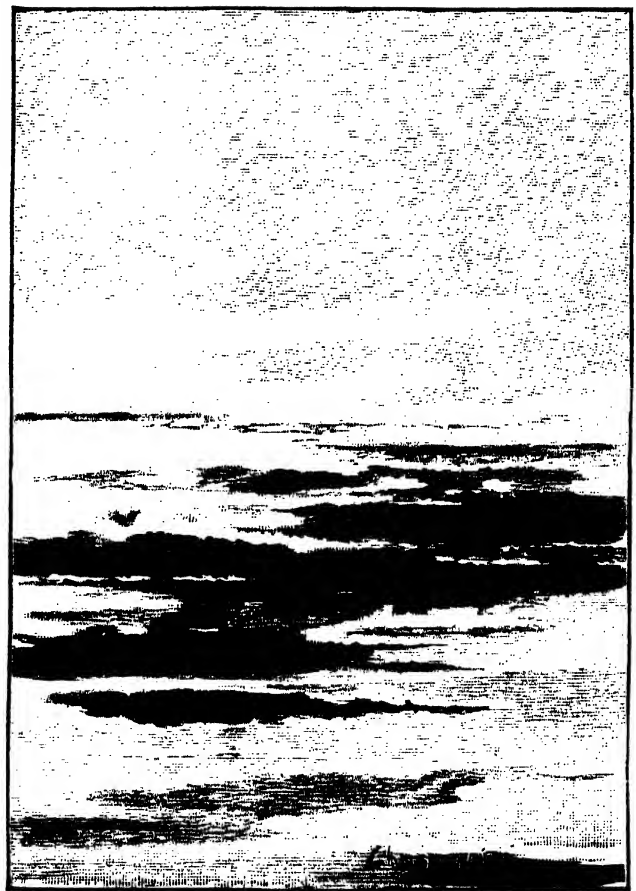
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Auroras or Northern Lights. Meteorology owes much to observations made by *H.M.S. Challenger*.

Meteorites are small meteors (q.v.). They are popularly called shooting-stars.

Meteors, or **FIREBALLS**, are bodies which do not belong to the earth, but come from other parts of space into our atmosphere, and are seen as bright balls of fire crossing the sky, with a train of light behind. Suddenly they are seen to go out, and very often a fall of stones occurs. Sometimes they are observed to break in two, and loud explosions like thunder are heard. They move very fast—ten or twelve miles per second, and are visible when between 40 and 80 miles above the earth. Other meteors dart across the sky and disappear, all in a very short time. These are known as *shooting stars*, and are sometimes big and bright, like planets. It is estimated that about six or eight meteors which drop stones come into our atmosphere every year; but some 20,000,000 of small bodies pass through the air every day—these would all appear as shooting stars if they occurred at night. At some periods of the year there are so many shooting stars that they appear like a shower of fire. On November 14th this happens, the shower being greatest every 33 years. A stream of meteors is travelling round the sun, and every 33 years the earth just comes through them. Meteoric showers also occur about August 9th to 11th, and smaller ones in April. The luminosity of meteors is due to the intense heat caused by the resistance of the air to their passage, and in support of this theory it is found that meteoric stones are always covered, either wholly or in part, with a crust of cement that has recently been melted.

Methane, known also by the names *light carburetted hydrogen* and *marsh gas*, is the first member of the group of hydrocarbons known as the paraffins. It is a colourless, odourless gas, slightly soluble in water. If subjected to cold and pressure it may be liquefied. Its chemical composition is represented by the formula CH_4 , and its density is hence 8; or, if referred to air, .56. It burns with a yellowish flame, with the production of carbonic acid and water. In the neighbourhood of the petroleum wells of America and the Caucasus the gas escapes from the earth, and in some districts (Baku) has been kept burning for years as sacred fires. It is evolved as a product of the decomposition of vegetation, and is thus found in swampy and boggy regions. [MARSH GAS.] It is frequently found in coal-mines and known to the miners as fire-damp. As it forms an explosive mixture with air, its presence is a source of considerable danger in mines, and has been the cause of many fatal explosions. It is also of interest from the fact that the study of this and some allied hydrocarbons first led Dalton to the formulation of the atomic theory.

Methodists, the members of a number of religious bodies, which owe their name and, in most cases, much of their doctrine and practice to the society in the Church of England founded by John Wesley in 1729 at Oxford, joined by George Whitfield in 1735. From their rigorous attention

to the duties enjoined on Christians in the New Testament, and their devotion to good works, the unawakened members of the English Church called them *Methodists*, which title they adopted. Not being allowed to set forth their views in the pulpits of the English Church, the leaders took to open-air preaching, and then soon organised a Church on the plan of that of the Moravian Brothers, by whom Wesley had been much impressed in Georgia and Herrnhut between 1735 and 1737. At the outset the Methodists exhibited a division into Wesleyans, who held Arminian views, and Whitfieldians, who were Calvinistic. The special feature of Methodism was the promotion of strong religious enthusiasm and great missionary zeal. Since 1766 Methodism has flourished in N. America, where are many sects, some being, unlike the British sects, episcopalian.

Methyl is the name given to the group of elements or radical CH_3 , which exists combined with other elements in very many compounds, as *methyl chloride* (CH_3Cl), *methyl cyanide* (CH_3CN), etc.

Methyl Alcohol, also known as **WOOD SPIRITS** or **WOOD NAPHTHA**, is the first and simplest of the series of compounds known as alcohols, and possesses the composition CH_3OH . It is found among the products of the dry distillation of wood and from this source it is usually obtained. It is a colourless and mobile liquid, which has a specific gravity of .796, and boils at 66°C . It is very inflammable, and is used as a source of heat, and largely as a solvent for caoutchouc, gums, and other organic products. If oxidised, it behaves like other primary alcohols, yielding an acid—in this case *formic acid* (q.v.).

Methylated Spirit consists of ordinary alcohol to which has been added 10 per cent. of *wood spirits* (methyl alcohol, q.v.). It is then allowed to be sold duty free, and is hence much cheaper than pure alcohol. It cannot be employed in preparations of consumable articles, but is largely used as a solvent for gums, resins, etc.; as a preservative; for use in spirit lamps; and instead of alcohol for all purposes where the presence of the wood spirit is not objectionable. Strong representation made in 1853 to Government showing the desirability of allowing alcohol to be used duty free for manufacturing purposes, led to the introduction of methylated spirit.

Metre, in language, especially in song or verse and in music, is the rhythmic arrangement of syllables or notes in respect of time-length and stress. The term, with descriptive epithets, is used to indicate the particular rhythmic system on which a verse or stanza is constructed. For instance, in English hymnology *common metre* denotes a stanza or verse of four lines, the first and third lines containing eight syllables with stress on the even places, and the second and fourth of six syllables with stress on the even places. This metre is also called an *iambic* metre, because the lines can be divided into similar dissyllabic sets of syllables called feet, in which the ictus or stress falls on the second syllable. [IAMBICS, TROCHEES.] Song and dance originally went together, and the rhythm of verse corresponded to the rhythm or measure of

the movements of the feet in dancing or marching. In most ancient metres the rhythmic ictus generally fell on a long vowel, or a vowel followed by more than one consonant, so that the syllable was long. The ictus of simple metres was marked by the beat of the descending feet or *thesis*, with which alternated the lighter foot of the metre or *arsis* ("raising"); but Latin metricians inverted the use of these terms, and their example is generally followed. Except in a comparatively few special cases, a long syllable had double the time-length of a short syllable or *mora*. [IAMBIC, DACTYL, HEXAMETER, SPONDEES.]

Metre, originally intended to be $\frac{1}{393708}$ millionth part of the earth's quadrant, and adopted as the standard of length in France. It is equal to 39.3708 English inches. [METRIC SYSTEM.]

Metric System is the modern French system of weights and measures. In 1790 the French Academy of Sciences appointed a commission to choose some scientific unit of length. They considered that $\frac{1}{10000000}$ of the earth's quadrant measured between the pole and equator would be both a convenient and natural unit. Measurements were made on the meridian through Dunkerque, and standards of the unit calculated from these measurements were made and deposited in the French archives. This unit was called the metre. Although more recent measurements of the earth's quadrant have differed somewhat from the previous one, the length of the metre remains unaltered. This, however, has caused it to become as arbitrary a unit as the English yard instead of a natural one, as was desired. The metre is divided into decimetres, centimetres, and millimetres (1 metre = 10 decimetres = 100 centimetres = 1,000 millimetres). Its multiples are the decametre (10 metres), hectometre (100 metres), and kilometre (1,000 metres). All other units of weight and measure are based upon the metre; thus, the are (q.v.), the unit of land measure, contains 100 square metres; the litre (q.v.), the unit of volume, is a cubic decimetre; and the gramme (q.v.) is related to the cubic centimetre. The prefixes deca-, hecto-, kilo-, deci-, centi-, milli-, are used with the other units, as with the metre, to denote multiples and sub-multiples. It was sanctioned as the legal system of weights and measures in France in 1801, and is in general use for scientific purposes.

Metropolitan, in the Greek Church, a prelate corresponding with our archbishop, so called from *metropolis* ("a chief city"). The metropolitan ranks above a bishop, but below a patriarch, which title is only used in the Eastern Churches.

Metternich, CLEMENS WENZEL NEPOMUK LOTHAR, PRINZ VON, was born in 1773 at Coblenz. After studying at Strasburg and Mainz, he travelled in England and Holland, and on his return married as his first wife, the granddaughter of Kaunitz. He made his mark as a diplomatist at the Congress of Rastadt in 1798, where he represented the Westphalian nobles. His conduct of the negotiations with Prussia in 1803-5 further enhanced his reputation, and in 1806 he was appointed Austrian

ambassador at the Court of France. He succeeded in lulling Napoleon while Austria was preparing for the campaign of 1809, after which he became Foreign Minister and Chancellor. He now thought it necessary for the interests of his master that Maria Louisa should marry Napoleon, and for the next few years Austria occupied a strong position owing to his diplomacy. Metternich was now created Prince of the Empire. In 1826 he became Home Minister in Austria, and as such put down the slightest tendencies towards liberalism. After 1830 his influence outside Germany declined, though in Austria he continued his repressive policy; but in 1848 he was obliged not only to resign office but to leave his country. Till 1851 he lived chiefly in England and Belgium. He died in 1859.

Metz, one of the strongest fortresses in Europe, is situated on the Moselle about 30 miles N. of Nancy. Its name is supposed to be a corruption of *Mediomatrici*, the name of the tribe which inhabited the district. It was the capital of the Frankish kingdom of Austrasia, and in after years became a free imperial city. In 1552 it was seized by Henri II. of France, and in that year stood a siege from the Emperor Charles V. From the Peace of Westphalia (1648) till 1871 it remained in the possession of France. The fortifications were strengthened by Vauban in 1674 and restored in 1830, and the Germans have still further added to them. The Gothic cathedral of Metz is remarkable for its size and the beauty of its spire. [BAZAINE.]

Meung, JEAN DE (JEAN CLOPINEL), a French mediæval writer, was born at Meun-sur-Loire in the middle of the 13th century. He continued the *Roman de la Rose*, altering its tone from that of a poem to that of a contemporary satire. He also translated the New Testament into single-rhymed quatrains. He died soon after 1300.

Meursius, JOHANNES (JAN DE MEURS), a great Dutch scholar, was born near the Hague in 1579. After having been travelling tutor to the son of Pensionary Barneveldt, he became successively professor of history and Greek at Leyden, and historiographer to the States-General. In 1625 he was given the chair of history at Sorø in Denmark, where he died in 1639. His chief works were the *Glossarium Græco-Barbarum*, *Historia Danica*, and editions of *The Characters* of Theophrastus, *De Re Rusticâ* of Cato, and of several late Greek writers.

Meurthe-et-Moselle, a French department, deriving its name from the rivers which traverse it, has Germany as its eastern, and the departments of Vosges and Meuse as its southern and western, boundaries. There are valuable iron and rock-salt mines, and manufactories of woollen and cotton goods, of glass and of pottery. Corn and the vine are also grown. Nancy is the capital, Toul and Lunéville being the other chief towns.

Meuse. 1. A river (called also MAAS), rises in France, in the department of Haute-Marne, flows northerly into Belgium, turns east at Namur, and, after another northerly course, finally bends westerly and joins the Waal, one of the mouths of the Rhine. When the stream again divides, the

northern part is called the Old Maas. The New Maas is the name given to the lower waters of the Lek, from Rotterdam downwards. It is connected with the Old Maas by a canal. The total course of the river is about 500 miles; it is navigable from below Verdun. The chief towns on its banks are Sedan, Namur, Liège, Maestricht, and Rotterdam.

2. A department in north-eastern France, on the Belgian frontier, having Meurthe-et-Moselle on the east, and Marne and Ardennes on the west. It has an area of 2,404 square miles. From its fertile soil much wheat and beet-root are produced, and the vines yield wine. There are also iron-mines and manufactures of glass and paper. Bar-le-Duc is the chief town, Verdun and Montmédy being the largest of the others.

Mexico, a country in the south of North America, consisting of 27 states, 2 territories, and the federal district of Mexico, the total area of the whole amounting to 751,177 square miles. The territory of Lower California is separated by the Gulf of California from the main body of the country, the S.E. limit of which (the peninsula of Yucatan) points north into the Gulf of Mexico.

History. The earliest known inhabitants, the Toltecs, were a highly-civilised people, who left splendid memorials of their skill in temples and monuments, the ruins of which are still to be seen. They were nearly exterminated by a pestilence in the 11th century, and were succeeded by ruder races, first the Chichimecs, and secondly the Aztecs, whom Cortes in 1519 found in possession of the land. In 1540 Mexico was united with other parts of America to form New Spain. For nearly three centuries it continued to be the chief Spanish possession, and was used simply as a great mining estate. After several abortive rebellions, the city of Mexico was taken from the Spaniards in 1821, and soon afterwards the republic of Mexico was founded under the auspices of Santa Anna (q.v.). Half a century of civil wars followed, during which Texas and another portion of Mexican territory were added to the United States. In 1861 England, Spain, and France had to interfere to protect the interests of their subjects, and Napoleon III. subsequently attempted to force the Archduke Maximilian (q.v.) upon the country as ruler. After his downfall, till the year 1871, Juarez (q.v.) was absolute in Mexico. On his death there was another period of strife, the end of which was the election of the able General Porfirio Diaz in 1876 as President. Diaz was re-elected for his seventh term of office in 1904.

Physical Features. The greater part of Mexico consists of an elevated table-land, sloping gradually to the Pacific, and sharply to the Atlantic coast. The principal range of mountains is the Sierra Madre. The chief peaks in Mexico are Nevado de Toluca (19,454 feet), in the Cordillera de Anahuac, and Popocatepetl (17,523), to the south-east of the capital. The last volcanic eruption was the upheaval of Jorullo in 1759. The Rio Grande del Norte separates with its stream Mexico and Texas. Several of its affluents water northern Mexico; but there are few other streams of any importance, and only one or two lakes of any size. On the plateau

the climate is that of perpetual spring; in the N. and N.W. there is very little rain. On the coast the climate is more variable. The only harbour of much utility is that of Acapulco on the Pacific coast. The soil is fertile, yielding maize, wheat, and several fruits; the forests, especially on the coast of Campeachy Bay, produce valuable timber.

Products, Trade, etc. The first cattle-ranches were established in Mexico, and in the north most of the inhabitants, besides foreign settlers, are engaged in this industry. The vine is also cultivated in Coahuila province and near El Paso. Agriculture, however, is hampered by want of water and distaste for the use of machinery. The labourers consist of semi-servile Indians. The silver mines of Mexico have always formed her chief wealth. Gold and copper are also obtained. The coal mines are as yet little worked. Pulque (a drink) is made from the Mexican aloe, and the woollen and cotton industries are encouraged by protective duties. The Mexican slouch hat or *sombrero* is largely made. Foreign trade is almost entirely with the United States and Great Britain. A large proportion of the exports consists of gold and silver, the rest being flax, hemp, sugar, hides, and timber. Railways and telegraph lines are of very recent introduction, and the roads are bad.

Social and Political Facts. Education has been very backward, but it is now free and compulsory, and the law is enforced. There is no established religion, but most Mexicans are Roman Catholics. As late as 1889 sun-worshippers were to be found in the province of Chihuahua. The external public debt was converted in 1890, and in 1891-92 for the first time expenditure fell beneath revenue. An enormous proportion of the latter goes to pay the fiscal gendarmerie. In spite of them and their exactions, Mexican trade is increasing.

MEXICO, the capital of the federal republic, is situated at a height of more than 7,000 feet above the sea-level, some 200 miles from Vera Cruz, in Campeachy Bay. It was founded by the Aztecs about 1325 in a district which was then covered with lakes. The chief building is now the cathedral, begun by the Spaniards in 1573 and completed at immense cost 80 years later. It contains the famous calendar stone. Beautiful paved roads, with double rows of trees, leading into the country on every side, form a picturesque feature of the place, which would be very unhealthy but for the dryness of the atmosphere. Many attempts have been made to drain the valley; the last, begun by English enterprise in 1890, was completed in 1898. The trade of the city is as yet not very important.

Mexico, THE GULF OF, a part of the Atlantic Ocean which is enclosed by Mexico, the southern states of the Union, and the northern West India islands. Between Cuba and Florida through the Florida Channel flows the Gulf Stream; and the former is separated from Yucatan by the Yucatan Channel, nearly 200 miles broad. The central parts of the gulf are deep, but the shore waters rather shallow. Strong N.E. gales blow across it from September to March. There are few good harbours, the coasts being lined generally by

lagoons. The Mississippi enters the gulf near New Orleans.

Meyerbeer, GIACOMO, the operatic composer, was the eldest son of Herz Beer, a wealthy Berlin banker of Jewish extraction. The name Meyer was afterwards prefixed from that of a benefactor. The date of his birth is probably 1791, but is sometimes given as 1794. At the age of seven he played in public Mozart's *Concerto in D Minor*, and he won his earliest laurels as a pianist. His *Crociato*, produced with great success at Venice in 1824, was his first work of any merit. In 1831 was given *Robert le Diable* with words by Eugène Scribe. It was followed in 1836 by *Les Huguenots*, soon after the production of which the composer became kapellmeister to the king of Prussia. *Le Prophète*, given at Paris in 1849, was the last of Meyerbeer's best works; *L'Étoile du Nord*, a comic opera; *Le Pardon de Plöermel* (or *Dinorah*), *L'Africaine*, are others of his works. He died in 1864.

Mezquit (*Prosopis glandulosa*), a leguminous tree, allied to the Mimosas (q.v.), native of Texas. It grows 30 feet high, with hard, durable wood; bi-pinnate, glaucous leaves; small, yellowish flowers, sessile in little heads; and indehiscent pods. The tree yields much valuable gum allied to gum-arabic. *P. pubescens*, the screw-bean, so called from its twisted pods, in Texas, New Mexico, and California, *P. dulcis*, the South American algarobo (the sweet pods of which are used for cattle food), and *P. juliflora*, of Jamaica, also yield gum mezquite.

Mezzotint, a method of engraving on steel or copper. First the whole surface of the plate is roughened, and then the roughness is lessened or removed for the lighter parts of the engraving. This process was invented (1643) by Van Siegen, a Dutchman. Its great drawback is that it does not allow of sharp and clear delineation of form.

Miall, EDWARD (1809-81), a prominent advocate of disestablishment, was a Nonconformist minister for several years. In 1841 he began to conduct the *Nonconformist*, and three years later was the chief founder of the British Anti-State-Church Association. From 1852 to 1867 he was M.P. for Rochdale, and from 1869 to 1874 for Bradford. He was author of *Title-deeds of the Church of England to her Parochial Endowments* (1861).

Miao-tze, a term applied by the Chinese in a general way to the semi-civilised hill tribes of the south-western provinces. They are numerous, especially in the Nan-Shan uplands about the frontiers of Kwang-si and Kwei-Chew, where they form autonomous communes in territory assigned to them by the Emperor Yung-Ching in 1730. Mention occurs of independent *Miao* tribes speaking distinct languages (probably Shan dialects), as early as 800 B.C., in which year an expedition was sent to drive them out of the province of Hu-nan. In his expedition of 1861 up the Yang-tze-Kiang Captain Blakiston met some of these *Miao*—a word in Chinese meaning "aborigines"—whom he describes as of quite a different type from the Chinese, with straight eyes, large nose, dark complexion without the least shade of yellow. But

descriptions vary with every group visited by travellers, so that no definite ethnical meaning can be attached to this term.

Mias. [ORANG.]

Mica is the name given to a group of silicates differing much from each other in chemical composition and optical properties, but having as a common character an easy cleavage in one direction, and thus affording plates remarkably thin, transparent, tough, flexible, elastic, and pearly. They are mostly silicates of aluminium and potassium, but also contain magnesium, iron, lithium, etc., and a little water. Their hardness ranges from 2 to 3, and their specific gravity from 2.7 to 3.1. They probably all crystallise in the Prismatic system, but occur in six-sided tabular crystals, some of which have clearly two optic axes, whilst others appear uniaxial, the two axes being not recognisably divergent, whence these forms were supposed to belong to the Hexagonal system. *Muscovite*, *Muscovy glass*, common, white or potash mica, is distinctly biaxial, and is a very common mineral, occurring in granite, gneiss, mica-schist (q.v.), and some sandstones. Plates sometimes more than a yard across are obtained in Siberia, Scandinavia, Canada, the United States, and Peru. It is used as a covering for gas-lamps, lanterns, and stoves, or even instead of window-glass. *Biotite*, black magnesia, or uniaxial mica, named after the French mineralogist Biot, also occurs commonly in igneous rocks. *Lepidolite*, lithia-mica, is a rose-pink or lilac mineral in pearly scales, whence its name (Greek *lepis*, "a scale"), giving the characteristic lithia red tint to the blowpipe flame. In retail trade muscovite is often erroneously called talc (q.v.).

Micah ("who is like unto Jah"), one of the minor prophets, contemporary with Isaiah, prophesied in the reigns of Jotham, Ahaz, and Hezekiah.

Mica-schist, a rock composed of quartz and mica foliated. The mica being in thin sheets causes the rock to split readily or be *schistose*. The mica is usually muscovite, but sometimes biotite. Garnet is a common accessory mineral; tourmaline and felspar less so. By addition of felspar it merges into gneiss. It sometimes appears to show traces of current-bedding and other indications of being originally sedimentary. It occurs in round granite bosses as a metamorphic zone, a mile or so broad, shading into slate or greywacke, and evidently due to contact-metamorphism; but it also forms vast regions in Norway, Scotland, the Alps, and elsewhere, of Archæan age, but not so clearly metamorphic in origin.

Michaelis, JOHANN DAVID (1717-91), a learned biblical scholar, was the son of JOHANN HEINRICH (1668-1738), director of Francke's "Collegium Orientale Theologicum." After travelling in England and Holland, he became *privat docent* at Göttingen, where he was afterwards professor of philosophy and Oriental languages for half a century. He translated the Bible and part of *Clarissa Harlowe* into German, and was the author of several exegetical and historical works relating

to the Hebrews, some of which have been rendered into English.

Michaelmas, a festival observed by the Anglican, Roman Catholic, and other churches on September 29, in celebration of St. Michael and All Angels. In England September 29 is one of the quarter-days on which rents are paid.

Michelet, JULES (1798-1874), was appointed in 1821 to a mastership at the Collège Rollin. In 1827 he became *maître de conférences* in the École Normale. His abilities and revolutionary opinions gained him a place in the French Record Office, and the post of assistant-professor to Guizot in 1830. Eight years later he was named professor of history in the Collège de France, a post held by him till 1852, when he refused to take the oaths to Napoleon III. He died at Hyères. The great work of Michelet's life was his *Histoire de France*. It was continued by a *History of the French Revolution* (of little value), and the beginning of a *History of France in the 19th Century*. Michelet also produced several studies, such as *Le Procès des Templiers*, and *La Sorcière*, numerous pamphlets against the Jesuits, *Du Prêtre de la Femme, et de la Famille*, and some popular books on natural history.

Michigan, one of the United States of America, is divided from Canada by Lakes Superior and Huron, and from Wisconsin by Lake Michigan. On the south and south-east are Indiana, Ohio, and Lake Erie. Its area is a little more than that of England and Wales, much the larger part of which is the southern of the two peninsulas which make up the state. The surface of the state is generally flat, but in the northern peninsula there is a range of hills, the highest point of which reaches 1,800 feet. This upper part is, generally speaking, rocky and barren, but rich in minerals; in the lower, wheat and other cereals, and in the western part fruits are grown. The copper mines of Keweenaw, the extreme northern part of Michigan, are the best in the world; in the centre of Lower Michigan coal is found in abundance, but not of good quality. Most of the iron comes from Marquette county, and of the gypsum from Grand Rapids. Small quantities of gold, silver, and lead are also found in the upper peninsula. Salt and timber come after copper and iron as the chief products of Michigan. Building and other stones abound, and there are several mineral springs. The commerce of Michigan is conducted by means of three ship canals, two of which are on the neck of land between Lakes Superior and Huron, and the other on the Keweenaw peninsula. Much wool is sent to market. Michigan is divided into 84 counties, the chief towns being Detroit, Grand Rapids, Saginaw, Bay City, and Lansing, the capital. The state university is at Ann Arbor; the state prisons at Jackson and Marquette. Education is in an advanced state, and there are many technical schools.

Michigan, LAKE, a long piece of water between Wisconsin and Michigan, joins Lake Huron between St. Ignace and Mackinaw. The name, which is Indian in origin, and means "Great Lake," was at first applied both to Huron and

Michigan, as they properly form but one lake. Michigan proper is 335 miles long, and varies from 50 to 90 miles in breadth. On the low shores are numerous lighthouses, and there are several harbours on the western coast. Mean depth of lake 325 feet.

Mickiewicz, ADAM (1798-1855), the poet of Poland, was born in Lithuania. His first volume of poems was published in 1822, and was succeeded three years later by a series of sonnets on the Crimea. In 1829 appeared *Konrad Wallenrod* and *Grazyna*, the subject of which was the struggle between the Lithuanians and the Teutonic Knights. The first was translated into English in 1841. *Pan Tadeusz* appeared in 1834. In 1840 Mickiewicz became professor of Slavonic literature at Paris; but he was unable to refrain from giving utterance to his political views, and was therefore deposed in 1843. Before his death he returned to Paris (where his collected works were first published in 1861), to become librarian to the Arsenal Library on the nomination of Louis Napoleon. He died at Constantinople, whither he had gone to organise a Polish legion—a service he had formerly performed in Italy.

Micmacs, North American Indians, formerly scattered chiefly along the coastlands of Nova Scotia, New Brunswick, Gaspé (Lower Canada), and in Prince Edward Island. The name appears to be a corrupt form of *Micvak* or *Micwanak* ("people of the west"), an expression applied generally to the Indians of Gaspé by the more easterly Cape Breton people. They are a branch of the Algonquian family, forming with the neighbouring and allied Miliceets the Souriquois nation, faithful allies of the French during the colonial wars. The Micmacs still number about 4,100, living as fishers and hunters chiefly in Nova Scotia and New Brunswick, and nowhere confined to reservations. Some are educated and are credited with possession of a peculiar alphabet or script of unknown origin.

Microbe. [BACTERIA.]

Microcline, a potash-felspar, or mineral silicate of aluminium and potassium, crystallising in the Anorthic system, but with one of its crystallographic axes so slightly inclined (whence its name) as closely to resemble orthoclase. Amazon-stone is a green variety of it.

Microcosm, "a little world," something representing, or supposed to represent, the idea of the universe, applied to man regarded as an epitome of the world; also used by Disraeli for a small society.

Microcosmic Salt, a salt which consists chemically of the acid phosphate of sodium and ammonium ($\text{H}\cdot\text{Na}\cdot\text{NH}_4\text{PO}_4 + 4\text{OH}_2$). It forms transparent, monoclinic crystals, soluble in water, and possessing a saline taste. If heated, they melt, and, giving off water and ammonia, become converted into acid sodium phosphate. It is employed as a blowpipe reagent in chemical analysis. It received its ordinary name from the fact that it is a product of the human economy and is found dissolved in the urine.

Microlepidoptera, a group of moths, including several different sections united together owing to

their small size. The Grass-moths (q.v.) or *Crambidae*, the Tabby House Moth (*Aglassa pinguinalis*, Linn.), and Meal-worm (q.v.) are familiar types.

Microlithic. [MEGALITHIC.]

Micrometer is an instrument used for the accurate measurement of small lengths or angles. The vernier (q.v.) and spherometer (q.v.) are examples of such instruments. The micrometer screw is one of the most important forms; it consists of an accurately-cut screw, the distance between two consecutive threads being very small—often $\frac{1}{80}$ of an inch. A large, carefully-graduated round head is fixed to the screw; so by giving this head a complete turn, the end of the screw advances $\frac{1}{80}$ of an inch. If the circular scale on the head is divided into, say, 20 parts, by moving it only through one division the end of the screw will advance $\frac{1}{1600}$ of an inch. The micrometer screw is attached to very many physical instruments, especially those used in optics, the micrometer microscope being one of the most delicate of measuring instruments. Telescopes are often provided with a tube across the end of which are stretched two parallel fine threads. These are movable by a micrometer screw, and enable astronomers to find the apparent distance between two stars which are very near to each other.

Micronesians, the natives of the Pelew, Marianne, Caroline, Marshall, and Gilbert archipelagoes (Micronesia), who belong fundamentally to the brown Polynesian race, but have been modified in diverse ways by intermingling with Malays, Papuans, Philippine islanders, Japanese and Chinese. Hence there is no particular Micronesian type, the colour varying from light brown or olive to a deep mahogany, the stature from below the medium height to five feet ten inches and even six feet; but the hair is almost uniformly black and long, and all the groups speak dialects of the Malayo-Polynesian language.

Microphone is an instrument for magnifying faint sounds, invented by Hughes in 1878. It depends upon the fact that if two conductors of electricity are in loose contact, any alteration of pressure at this contact will alter the resistance and therefore increase or diminish the electric current. Suppose a carbon pencil loosely touches two carbon blocks which are in circuit with a battery and a telephone, the carbons being fixed to a sounding board: any sound, however faint, is due to vibrations of the air: these vibrations are communicated by the board to the carbon blocks, so that the pressure between them and the pencil is constantly changing. The variation of the current so caused sets up vibrations in the telephone, where the original sound is heard in increased intensity. By this means even the foot-fall of a fly may be rendered audible.

Micropyle (from the Greek *mikron*, "small;" *pulon*, "a door") is the name of the opening left at the distal end of the ovule in seed-bearing plants when the coats of the ovule (primine and secundine) grow up over it. The outer opening, through the primine, which is sometimes the wider, is

known as the *exostoma*; the inner, through the secundine, as the *endostoma*. Through the micropyle the pollen-tubes pass in the process of fertilisation in angiosperms; but in gymnosperms the pollen-grain itself falls into the micropyle, where it is retained by a secreted drop of honey. The micropyle persists through the various changes of the coats until the seed is ripe, when it may be visible to the naked eye or can be easily detected by soaking the seed and then squeezing it, a jet of water issuing from it. In the sprouting of the seed the radicle or primary root first finds its way out through the micropyle.

Microscope is an instrument which magnifies the size of an object so that things often invisible to the naked eye are rendered large and distinct by its aid. In its simplest form it consists of a single convex lens, either provided with a handle for ordinary use as a reading-glass, etc., or mounted on a stand, where it can be adjusted by suitable means till it is in the correct position for viewing an object. A simple microscope of very high power is obtained when the lens is part of a glass sphere around which a deep groove has been cut and filled up with black matter. In the *compound microscope* an inverted image of the object is formed by a lens or group of lenses, known as the object glass, and this image is viewed by the observer through another lens or group of lenses called the eye-piece. Below the object-glass is the stage upon which the object is placed. A hole in the centre of the stage allows light to be reflected from a mirror below, through the object if it is transparent, so that it may appear brighter. If the object is opaque, light is made to fall on it by means of lenses above. The instrument is generally focussed by first moving by hand the tube containing the object-glass and eye-piece, and then making a fine adjustment by means of a screw. The power of a microscope is altered by changing either the object-glass or the eye-piece, and larger instruments are provided with more than one of each.

Microspore, the small or male spore in the heterosporous Pteridophyta (q.v.), such as *Selaginella* and the Rhizocarps (q.v.), in which there are two kinds of spores. The microspores are small and generally unicellular, resembling pollen-grains in structure, though not in function. They germinate, each producing a small and simple male prothallium and antheridium.

Microtome, THE, is an instrument for cutting sections of specimens to be observed under the microscope. It consists essentially of a holder for the specimen, and a rest for the razor. As a rule, the razor moves along the rest to cut the specimen, which is usually either frozen or hardened by some liquid such as alcohol, but sometimes it is the specimen which is moved against the razor. After the first cut, the specimen holder is raised by a micrometer screw through a distance equal to the thickness of the required section and another cut is made by the razor. By this means a section of uniform thickness is obtained. Microtomes may be obtained which are quite simple in construction;

while others are of the most complicated design, and are provided with many adjustments. Consequently they vary enormously in price.

Midas, a king of Phrygia, who in return for a service done to Silenus, was granted the power of changing everything into gold by his touch. Finding the boon somewhat of a burden, he bathed in the waters of Pactolus in order to rid himself of it. Gold washings are now found in the bed of this stream. Among stories related of him is the one of his being given ass's ears by Apollo because in a flute contest he decided in favour of his rival Pan.

Middleburg, a town in the island of Walcheren, and capital of the province of Zeeland in Holland. The town-house contains statues of 25 counts and countesses of Holland and Zeeland, and the museum of the Academy of Sciences one of Lipperskey's earliest telescopes. The 12th-century abbey has been metamorphosed into offices. The town was once one of great commercial importance, and its cotton-factories are still noteworthy.

Middlesbrough, a manufacturing town and port in the North Riding of Yorkshire, is situated at the mouth of the Tees, eight miles below Stockton. By the discovery in 1850 of iron-ore in the Cleveland hills it was changed from a small town to an important manufacturing centre, the seat of the Cleveland iron district. Besides this it has large ship-building yards and docks, and exports coal in great quantities, and in recent years salt-boring has become an important industry. By the Reform Bill of 1867 Middlesbrough became a parliamentary borough. In 1889 a town-hall and municipal buildings were opened. The Albert Park was given by the first mayor and member, Mr. H. W. Bolckow, to whom a monument was unveiled in 1881. Pop. (1901), 91,317.

Middlesex, one of the southern counties of England, has Hertfordshire on the north, Essex on the east, Buckinghamshire on the west, and Surrey on the south. It was the country of the middle Saxons, lying between Essex and Wessex, but was never an independent kingdom. From 1101 until 1888 the county belonged in theory to the city of London, whose mayor was its lord-lieutenant. The surface is gently undulating, with no river except on its eastern, western, and southern boundaries. Brentford, Uxbridge, Hounslow, and Harrow are the only towns of any size, but there are many large villages. Near Barnet, in the north, was fought the battle of 1471, in which Warwick fell. The population is very dense, especially in the neighbourhood of London, which now forms a separate "county." In 1901 it was 3,585,139.

Middleton, CONYERS (1683-1750), the earliest of clerical rationalists, was born at Richmond, Yorkshire, and in 1706 became fellow of Trinity College, Cambridge. In 1722 he was appointed university librarian, and afterwards held the living of Hascombe, Surrey. His chief works, besides an able *Life of Cicero* (1741), were the *Introductory Discourse* and *Free Inquiry* well known to readers of Mr. Leslie Stephen and Mr. Lecky.

Middleton, THOMAS, English dramatist, was born about 1570 in London, and died in 1627. In 1620 he was appointed City Chronologer, in which office he was succeeded by Ben Jonson; and he frequently wrote for and arranged the city pageants. He wrote both tragedies and comedies, frequently, as was then the custom, in collaboration. *The Roaring Girl* (1611) was written with Dekker; *A Fair Quarrel*, *The Old Law*, and many others with Rowley; while Jonson and Fletcher may have had a hand in *The Widow*. Some of the most popular were *A Mad World, my Masters*, *The Mayor of Queenborough*, and *A Trick to catch the Old One*: but the posthumous plays, *The Changeling*, *The Spanish Gipsy*, and *Women, beware Women*, are probably the best. A play directed against the Spanish marriage produced in 1624, and called *A Game at Chess*, took the public by storm, but was interdicted by the authorities, and the author was summoned before the Privy Council.

Midianites, the descendants of Midian, fourth son of Abraham by Keturah. The Midianites dwelt in the land of Moab (Arabia Petraea), and were engaged from early times in commerce with Egypt. They were exterminated by Moses, because the women entered the Israelitish camp and seduced the Israelites.

Midshipman, a young gentleman who, having been a cadet, is in the further process of training to become a commissioned officer in the Royal Navy. His next step in promotion is to the rank of sub-lieutenant. He receives pay at the rate of 1s. 9d. a day, and is nominated by an order, not by a commission or warrant. To qualify for promotion he must, in addition to having passed his examinations, be 19 years of age and have completed five years' service.

Mieris, a family of Leyden painters, of whom FRANS VAN MIERIS (1635-81) was the best. He had many patrons, including Cosmo III. of Tuscany and the Elector-Palatine, and rapidly grew wealthy. His pictures are small and polished, but have not the softness of his master, Gerard Dow. WILLIAM, his son (1662-1747), imitated his father, as did also other members of the family.

Migne, JACQUES PAUL (1800-75), a Catholic priest, born at St. Flour, established near Paris in 1836 a great publishing-house, from which issued *Collection des Orateurs Sacrés* (100 vols.), *Patrologiae Cursus Completus* (221 volumes in the Latin series, and 162 in the Greek), and the *Encyclopédie Théologique*, which appeared between 1846 and 1866 in 171 volumes. The Archbishop of Paris forbade the continuance of the undertaking, and a great fire in 1868 effectually carried out his orders.

Mignet, FRANÇOIS AUGUSTE (1796-1884), a great French historian, was a native of Aix, in Provence, where he studied law with Thiers, and was called to the bar at the same time. Three years later he came to Paris, where he lectured at the Athénée, and wrote for the *Courrier Français*, and afterwards for the *National*. In 1824 was published his brilliant short *History of the French*

Revolution, which exerted great effect upon the public mind, and won for its author after the Revolution of July, 1830, the post of keeper of the archives at the Foreign Office. He retained the position till 1848, when he was deposed by Lamartine, and retired into private life. In 1833 Mignet visited Madrid on a secret mission, and the result of his inspection of the Simancas archives was *Négociations relatives à la Succession d'Espagne sous Louis XIV., Charles Quint, La Rivalité de François I^{er} et de Charles Quint*, and other valuable works. In 1851 he published his *Histoire de Marie Stuart*. He was elected to the Académie Française in 1836.

Mignonette (*Roseda odorata*), a herbaceous, sweet-flowered plant, native to Syria and north Africa, introduced into English gardens from France in 1742. It has dense, terminal, bracteate racemes of small flowers, each of which has generally six green sepals, and as many petals, below a relatively large and one-sided disk. The posterior petals have a concave greenish claw and a white limb cut into a tuft of club-shaped segments; but the anterior ones are more reduced, having often only one such segment. On the disk are the numerous stamens, with brownish red anthers, which give a colour to the whole inflorescence. The ovary is one-chambered, but made up of three carpels, which separate at the top at an early stage. The fruit is a many-seeded capsule. Though naturally an annual, and liable to be killed by autumn frosts, by removing its flower-buds the development of mignonette can be so prolonged that it becomes a perennial known as *tree mignonette*. The flowers are not beautiful, but are valued in gardens for their extreme fragrance. Two British species of the same genus—which is the type of a small order of Thalamifloræ (q.v.)—*R. lutea*, the wild mignonette, and *R. luteola*, weld or dyer's-greenweed, once used as a dye, have scentless flowers.

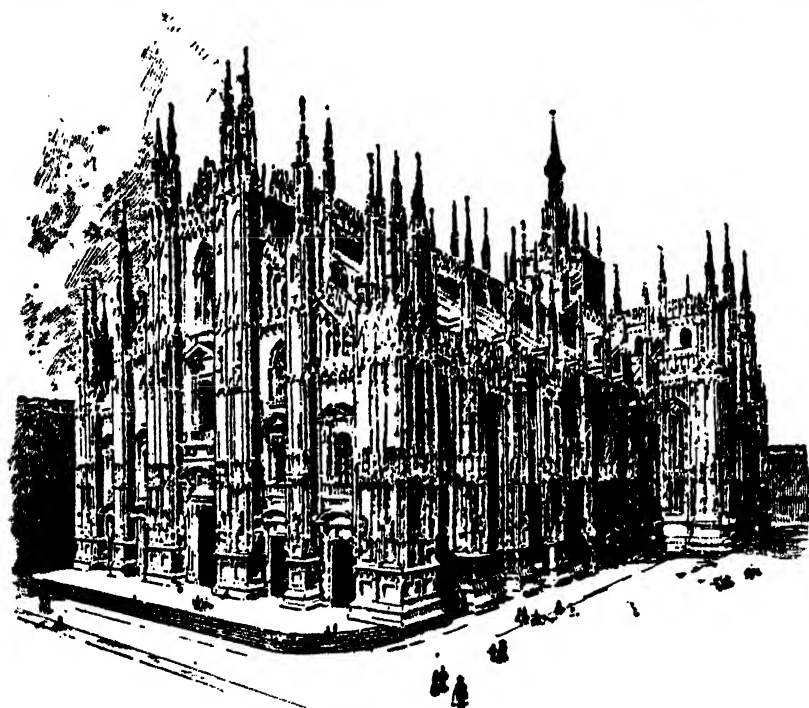
Migration, the term applied by naturalists to the periodic movements of birds. Sometimes it is used in a wider sense, so as to denote the wanderings of other animals, as the movements of fish to deposit spawn, the journeys of reindeer in search of food, the descent of wolves in winter from mountains and hill-regions to the plains, and to the march of lemmings at irregular intervals southwards to the sea, from which none ever return. But Wallace, while citing these and similar instances, restricts the expression to the movements of birds, with a possible exception in favour of fishes. The phenomenon has been known from the earliest historic times, and in the oldest literature references to it occur. But the times of migration differ in various countries, as do the migrants themselves. In England, for example, flocks of birds arrive in the spring from the south, pass the summer with us, building their nests and rearing their young, and take their departure again in the autumn. The swallow, the warblers and the chats, and the cuckoo are familiar examples. To a second class belong those birds who leave their

breeding-places in regions to the north of us, driven southwards by the approach of arctic or sub-arctic winter. These arrive on our shores in the autumn, and leave us in the spring. Among such are the fieldfare, the redwing and the woodcock. To a third class belong those birds—the sandpipers, for example—which stay with us for a short period in their northward journey in the spring, and their southward return journey in the autumn; and to these the term "birds of passage" is properly applied. In the southern hemisphere the movements are reversed, and migration is southward in spring and northward in autumn. Besides the movements from continent to continent, there are others of limited range; and to those occurring at irregular intervals the term "irruptions" has been applied—e.g. to the visits of the sandgrouse, whose home is in central Asia, to Europe and Britain in 1859, 1863, and 1888. Many theories have been proposed to account for the fact of migration. That most generally accepted was put forward by Wallace. He, of course, put on one side the idea of "unerring instinct;" for, though birds follow determinate routes, numbers lose their way and perish. He puts the case of a species in the remote past, in which the area suitable for breeding and the area in which sufficient food could be found were at first the same, but which, owing to geological and climatic changes, gradually diverged from each other, and believes that the habit of incipient and partial migration at the proper seasons would at last become hereditary and so fixed as to be what is called an instinct; and that when the natural history of a sufficient number of species is worked out, we may find every link between species in which the two areas are coincident to those in which they are absolutely separated (*Nature*, x. 459). This divergence of breeding and subsistence areas with regard to the migratory birds of Europe probably took place in the Ice Age, and this view is supported by the fact that prior to that period mammals now found only in regions much farther south ranged over Europe, with which Britain was then connected.

Miguel, DOM MARIA EVARISTO (1802–66), the Portuguese usurper, was a younger son of King John VI. In 1824, in conjunction with his mother, he plotted the overthrow of the constitution, and arrested the ministers; but the king being supported by England, Miguel was banished. Two years later, when he was made regent for his niece Maria, he renewed his intrigues, and by the help of the Absolutist party was made king in 1828. In 1832 he was driven from power by English help, and never again appeared in Spain, where he was hated for his tyranny and dissoluteness.

Milan (MILANO, a contraction of MEDIO-LANUM), a historic city of Italy, stands on the small river Olona, 25 miles south of Lake Como. In 222 B.C. the Romans took it from the Insubrian Gauls. It afterwards suffered much from the barbarians, being sacked by the Huns in 452 and by the Goths in 539. It was next in the possession successively of the Longobardi (or Lombards) and

the Franks, and then passed under the sway of the emperor. The citizens, under their archbishop, stoutly resisted their feudal neighbours, and in the 11th century headed a league of Lombard towns against the Emperor Frederick I., who razed the city to the ground. Milan also took part with the Guelfs against Frederick II. In 1262 Otho Visconti, the Archbishop, obtained the lordship for his family, who held it with but a short interval for nearly two centuries. The lordship next passed to the Sforzas, the first of whom had married Bianca Visconti. They alternately opposed and became tributary to the French and



MILAN CATHEDRAL.

the emperor, who each claimed the Milanese. From 1535 till the Peace of Utrecht the territory was a dependency of Spain. It then passed to Austria, which was deprived of it for a time by Napoleon, but again held it till at the Peace of Villafranca it became part of Piedmont. In 1848 Milan had led the Italian struggle for liberty. The city stands in a fertile plain, and is built in a circle, with the splendid marble cathedral in the centre. This was begun under Gian Galeazzo Visconti in 1386, and was completed under the Napoleonic régime, but still undergoes alterations from time to time. It is the third largest cathedral in Europe. Other interesting churches are those of St. Ambrogio and Santa Maria della Grazie. On the refectory walls of the monastery to which the latter belonged, Leonardo da Vinci's great picture was painted. Chief among the modern buildings are the Della Scala opera house, one of the largest in Europe, and the Great Hospital, which will hold more than 2,000 patients. The Brera Picture Gallery contains a valuable collection. Milan has two great libraries, the Ambrosian and the National Library. It is now the chief commercial centre of northern Italy, the

principal industry being the silk manufacture. Mulberry-trees for feeding the silkworms cover the surrounding plains. It is also a city of printers. The Galleria Vittorio Emanuele, an avenue roofed with glass, is one of the finest promenades in Europe. In population Milan is the second city of Italy. It has numbered among its citizens, besides St. Ambrose, Beccaria and Manzoni.

Mildew, the name popularly applied to various fungi, either parasitic upon higher plants or saprophytic upon damp paper, linen, etc. The chief are the *vine-mildew* and the *corn-mildew*—the former, *Erysiphe* (formerly *Oidium*) *Tuckeri*, consisting of a white "mycelium," or "spawn" of fine threads covering the leaves and young fruit, sending suckers, or "haustoria," into the plant, and bearing also ascending stalks, each ending in an oval "spore" (q.v.). *Corn-mildew* (*Puccinia graminis*), belonging to a distinct order of Fungi, the *Æcidium* *mycetes*, is a remarkable example of "heterœcism," living, that is, parasitically on more than one host plant. On straw or dry grasses in autumn it appears as narrow black lines, which under the microscope are seen to consist of a mass of two-celled spores, each terminating a hypha or thread of spawn. In spring each of these *teleutospores* ("last spores"), as they are called, puts out a short tube or thread, termed the *promycelium*, bearing on its branches several minute cells or *sporidia*. These will only germinate on the leaves of the barberry, which they pierce and fill with *mycelium* ("spawn"). This mycelium bears flask-shaped bodies called *spermogones* on the upper surface of the barberry leaf, which are filled with small oval bodies, called *spermatia*, of unknown function, but possibly male. Through

the under surface of the barberry leaf there burst from the same mycelium numerous round orange-coloured bodies which spread into small cups, known as *cluster-cups* and filled with chains of spores. These cluster-cups were formerly known as *Æcidium berberidis*, and their spores are termed *æcidiospores*. These spores will only germinate on the leaves of some grasses, filling them with mycelium and bursting through their surfaces in a mass of oval, brown, one-celled spores known as *Uredo* *segetum*. These spores can infect other grasses, giving rise on them to mycelium bearing similar spores; but late in summer, among the *uredo*-spores and on the same mycelium, appear the black, two-celled *resting-spores* or *teleutospores*, already described, which live through the winter and start the fresh cycle of generations.

Mile, a measure of distance first used by the Romans. The word, etymologically, means "a thousand" (paces of a Roman soldier). It is used to designate a number of lengths varying from the Saxon mile of 9,913 complete yards to the Greek mile of 1,412 complete yards. The old Roman

mile contains 1,617 English yards, and the English statute mile (legalised 1593) 1,760 yards = 320 perches or poles. The mediæval English mile (divided into 10 furlongs) was equal to 2,203½ yards, the old London mile to 1,666½ yards, the ancient Scottish mile to 1,976 yards, the Irish mile to 2,240 yards, and the Welsh to nearly 4 miles English.

Mile, NAUTICAL, the length of a minute of the meridian. It varies, therefore, according to the latitude. It is, in other words, equal to a minute of arc on a circle whose radius is the radius of the curvature of the meridian at the latitude of the place. [DEGREE.] It is important to distinguish this from the geographical mile, which is the length of a minute of arc on the earth's equator, and is therefore a constant quantity—viz. 6,080 feet, and equals the Admiralty knot or mile (1·151 statute mile).

Miletus, an ancient Ionian city, on the Latmian Gulf, on the W. coast of Asia Minor, near the mouth of the Mæander. It was founded by a band of colonists from Pylos, became a thriving commercial town, and before 650 B.C. had planted some 60 or 80 colonies along the coasts of the Hellespont, the Propontis, and the Euxine. The Milesians long resisted the encroachments of the Lydian monarchs, but finally submitted to Cræsus. After his fall they were conquered by the Persians, but took the lead in a rebellion against Darius (500 B.C.), and, as a punishment, were transported to the mouth of the Tigris. Later, Miletus again became a busy mart, but never regained its lost glory. The philosophers Thales, Anaximander, and Anaximenes, and the historian Hecatæus were natives.

Milfoil, *i.e.* thousand leaves, is the English name of *Achillea millefolium*, also known as YARROW, a common British member of the order Compositæ, so called from its much-cut leaves. It is a herbaceous perennial, with erect stem, about a foot high, bearing a flat group (corymb) of small white or pink flower-heads, each containing very few florets. The whole plant has a pungent smell, and is astringent. The name *water-milfoil* is applied for the same reason to *Myriophyllum*, a genus of aquatic plants, three species of which are British, belonging to the mare's-tail family, Haloragacææ.

Milford, a parliamentary borough and seaport of Pembrokeshire, on the N. side of Milford Haven, nine miles S.W. of Haverfordwest and 282 miles W. of London by rail. The Haven is a magnificent sheet of water, 12 miles long and from one to two broad. The royal dockyard, constructed in 1790, was in 1814 removed to Pater. Pop. (1901), 5,101.

Military Bands. [ORCHESTRA.]

Military Engineering. [MINING.]

Militia, an organised force of armed citizens enrolled and trained for the defence of their country. Such are the National Guards in France, the Landwehr in Germany and Austria, and the military force of the United States. In England the Militia was a force of very old standing. Important changes were made by the Territorial and Reserve Forces Act, 1907. The Militia by that Act

was transferred to, and now it constitutes the main portion of, the Special Contingent of the Army Reserve. The Force is subject to foreign service, and on joining the men carry out a course of six months' training, followed in each subsequent year by a few days' training and musketry.

Milk, the fluid secreted by the mammary glands of all female mammals for the support of their young. It consists of a solution of sugar, albuminoids, and salts, together with a certain amount of fat. The milk of all mammals is the same in the nature of its constituents, but the proportion in which they are present varies very much. Milk contains about 80 or 90 per cent. of water, and in that of the cow there is about 5 per cent. cream. When churned the globules (of which milk is largely composed) unite, and *butter* is formed, the residue being the buttermilk. If rennet (q.v.) be added to skimmed milk, *curds* and *whey* will be formed. *Cheese* is made by allowing the whey to separate and adding salt to the curds. Milk ferments spontaneously, the milk-sugar [LACTOSE] being converted into lactic acid (q.v.), alcohol, and carbonic acid gas.

Milk Fever. The establishment of the secretion of milk shortly after childbirth is usually attended with some small degree of constitutional disturbance, and if this be so marked as to appreciably affect the temperature of the mother the condition is known as milk fever.

Milk Sugar. [LACTOSE.]

Milkwort, the English name of the five native species of the considerable genus *Polygala*, the type of the order Polygalacææ, applying apparently to their supposed value as food for milch cows. Though some of the exotic species, such as the yellow-flowered *P. Chamæbuxus* of central Europe, and some red-flowered ones at the Cape, are shrubby, the British species are small herbs, mostly common on dry soils, with small entire leaves and racemes of flowers (either red, white or blue) of remarkable monosymmetric form, something like a pea-blossom. They have five persistent sepals, the two lateral ones, or "wings," petaloid but veined; from three to five petals, one forming a "keel" with a fringed extremity; eight stamens with anthers opening by pores; and a two-chambered, two-seeded capsule. The milk-worts are also called *gang-weeds* or *Rogation-flowers* from having been carried in Rogation-tide processions. *Glaux maritima*, a small member of the primrose family, with grey or glaucous leaves, is called *sea milkwort*.

Mill, JAMES (1772–1836), philosopher, was born in Forfarshire, and studied at Edinburgh University. He was licensed as a preacher in 1798, but in 1802 he came to London with Sir John Stuart of Fettercairn. He started the *Literary Journal* in 1803, and in 1805 became editor of the *St. James's Chronicle*. From 1808 to 1813 he was connected with the *Edinburgh Review*. His great work, the *History of India*, which occupied him from 1806 to 1817, obtained for him in 1819 an appointment in the India House as assistant examiner of correspondence. His friendship with Bentham, which

began in 1808, exercised an important influence on the development of his political and social views. The doctrines of the "Philosophical Radicalism" of which he was the chief exponent, were well-expressed in his essay on *Government* (1820), one amongst several contributed to the 5th edition of the *Encyclopædia Britannica*. In 1824 Bentham started the *Westminster Review*, for which Mill wrote several able essays. His *Analysis of the Human Mind* (1829) was an important contribution to empirical psychology. Among his other works were *Elements of Political Economy* (1821) and *A Fragment on Mackintosh* (1835). He was head of the India Office from 1830 to his death. His view of life was mechanical, and he could conceive of no other means of promoting social welfare; art, poetry, religion—the whole sphere of the æsthetic and moral emotions—lay entirely beyond his ken. His rigid and abstract method of reasoning—entirely *à priori* and deductive in scope—exercised a powerful influence in his own day.

Mill, JOHN STUART (1806–73), philosopher, son of James Mill (q.v.), was born in London. Up to his 15th year he was educated entirely by his father, who aimed at training him to be the exponent of his own political and philosophical views. Between the ages of three and eight he was taken through some of the principal Greek authors, and four years later he was launched on a course of logic and political economy. After spending part of the years 1820–21 in France with the family of Sir Samuel Bentham, he studied law with John Austin; but the project of a career at the bar was abandoned on his obtaining a clerkship in the India House (1823). The reading of Dumont's *Traité de Legislation*, a summary of Jeremy Bentham's views, formed, as Mill himself says, an "epoch in his life" and led to the establishment of a "Utilitarian Society" which met at the house of the sage himself; but at the meetings of the Speculative Debating Society (founded in 1825) he was brought into contact with philosophical Liberals of a different school—Maurice, Sterling, and other ardent youths whose ideas had been moulded by the teaching of Coleridge—and to their influence was mainly due the great mental crisis through which he now passed. The partial change which now took place in his views is observable in *Thoughts on Poetry* (1833), inspired by a study of Wordsworth and Shelley, and the articles on *Bentham* (1838) and *Coleridge* (1840) in the *London and Westminster*. But, although he was thus led to modify the doctrines in which he had been brought up, he never abandoned them. About 1837 he became acquainted with the system of Comte, and Comte's sociological method has greatly influenced the sixth book of the *Logic* (1843). The *Principles of Political Economy* (1848), which had been preceded by *Essays on Unsettled Questions in Political Economy*, written in 1831, was hailed as the last word on economic science, but the growth of the historical school has completely reversed the verdict. To the ensuing period belong *Liberty* (1859) and *Representative Government* (1861); the former, an eloquent plea on behalf of individualism, was written,

as were many of his works, in co-operation with his wife (previously Mrs. Taylor), who had died in the preceding year. *Utilitarianism* was published in 1863, and the *Examination of Sir William Hamilton's Philosophy* in 1865. During Mill's brief career in Parliament as member for Westminster (1865–68) his earnestness and sincerity were generally recognised. He incurred much hostility, however, by his support of Mr. Bradlaugh's candidature at Northampton, and by his activity against Governor Eyre owing to his ruthless suppression of the Jamaica insurrection. The last five years of his life were passed in retirement at Avignon with his step-daughter, Miss Helen Taylor. *The Subjection of Women* was published in 1869, and after his death appeared the *Autobiography* (1873), and *Three Essays on Religion* (1874), which indicated a certain reaction against his earlier Agnosticism.

Millais, SIR JOHN EVERETT, R.A. (b. 1829), was born at Southampton and brought up in Jersey, to which his family belonged. He became a student at the Royal Academy at the age of eleven, and in 1846 exhibited his first picture *Pizarro seizing the Inca of Peru*. He now became convinced of the conventionality and unreality of contemporary art and he joined with Rossetti, Holman Hunt, and others in founding the "Pre-Raphaelite Brotherhood," whose aim it was to give a faithful representation of nature. To this period belong *Isabella* (1849), *The Carpenter's Shop* (1850), *The Huguenot* and *Ophelia* (1852), *Autumn Leaves* (1856), and *The Vale of Rest* (1860). *The North-West Passage* (1874) is one of the finest examples of his later methods. His landscapes, such as *Chill October* (1871) and *The Fringe of the Moor* (1874), for the most part depict the wilder aspects of the scenery of Scotland. Among his best portraits are those of Mr. Bright (1880), Cardinal Newman (1882), and Lord Salisbury (1883). He was made an A.R.A. in 1853, and R.A. in 1863, and a baronet in 1885. On the death of Lord Leighton he was made President of the Academy, but died in 1896.

Millbank Penitentiary, a prison formerly situated on the Thames below Vauxhall Bridge, in the parish of St. Margaret and St. John, Westminster. It was completed in 1821, held over 1,000 prisoners, and was taken down in 1890. The idea of a "Panopticon" or circular prison, with cells on each floor and in the centre a room for the inspector from which he might see into every part of the building, originated with Jeremy Bentham, whose brother, Sir Samuel Bentham, had devised a structure of this kind for the supervision of industry. An Act of Parliament for the purpose was passed in 1794, and land at Millbank was conveyed to Bentham as trustee; eventually the contract with him was cancelled. The erection of the Pan-opticon, though it did not realise Bentham's hopes, marked an advance in prison management and discipline.

Millennium, a period or interval of a thousand years. In theology, the period in which the kingdom of Christ is to be all-powerful on earth, universally expected by Christians during the early centuries of our era. This expectation is called Chiliasm.

Millepedes, the animals belonging to the order Chilognatha or Diplopoda, which together with the order of Centipedes form the class Myriapoda (q.v.).

Millepora, a genus of that group of corals known as Hydrocorallina (q.v.).

Miller, HUGH (1802-56), geologist and man of letters, was the son of a seaman of Cromarty, where he was born and brought up. His first volume, *Poems written in the Leisure Hours of a Journeyman Mason* (1829), was favourably reviewed. *Scenes and Legends of Cromarty* appeared in 1835. His pamphlet entitled *A Letter to Lord Brougham* (1839) brought him to the notice of the leaders of the "Free Church" party, and in 1840 he became the editor of their journal, the *Witness*. The appointment occasioned his removal to Edinburgh, where he remained during the rest of his life. The mental strain proved too great for a constitution already weakened by the hardships of his youth, and in a fit of madness Miller committed suicide. In the *Witness* were published the series of papers called *The Old Red Sandstone* (1841). In his pictorial works, *Footprints of the Creator* (1850) and the *Testimony of the Rocks* (1857), he wrote eloquently on behalf of revealed religion. He was also author of an extremely interesting autobiographical sketch called *My Schools and Schoolmasters* (1854).

Millet (from the Latin *mille*, "a thousand," from their numerous small fruits) is a name applied to a variety of cereal grains, much grown in hot countries for human food, but not entering largely into English commerce. The name is chiefly applied to *Panicum miliaceum* and other species of that genus, whilst Great Millet, Indian Millet, and Turkish Millet are names for *Sorghum vulgare*, the Durra (q.v.). *P. miliaceum*, the common millet, has been cultivated from prehistoric times in Asia, Egypt, and southern Europe, its grain occurring in the Swiss lake-dwellings. It requires a rich, friable soil, and yields a very nutritious grain, which makes excellent bread. *P. italicum*, Italian Millet, seems to be indigenous in Japan, China, and the Indian archipelago, and its cultivation spread at an early period through Russia and Austria to Switzerland, where its grain is found in the oldest lake dwellings. In England millet is mainly used for poultry.

Millet, JEAN FRANÇOIS (1814-75), French peasant painter, was born in the hamlet of Gruchy, near Gréville, in Normandy. In his boyhood he worked with his father in the fields, but the aid of the municipality of Cherbourg enabled him to study painting under Monchel in that town and afterwards under Delaroche in Paris. After eight years of poverty in Paris, he settled at Barbizon, near Fontainebleau, where he formed a close friendship with Theodore Rousseau. At Barbizon all his best works were produced, including *The Angelus* (1859), *The Sower* (1850), *Peasants Grafting* (1855), and *The Shepherdess and Flock* (1864).

Millstone Grit. [CARBONIFEROUS SYSTEM.]

Milman, HENRY HART (1791-1868), Dean of St. Paul's and ecclesiastical historian, was educated at Eton and Brasenose College, Oxford, and in 1817 was presented to the living of St. Mary, Reading. The publication of his drama *The Fall of Jerusalem* (1820) was followed by his appointment to the chair of poetry at Oxford. He was Bampton Lecturer in 1827, became rector of St. Margaret's, Westminster, in 1835, and in 1849 was made Dean of St. Paul's. In 1829 appeared the *History of the Jews*. His *History of Christianity under the Empire* (1840) and *History of Latin Christianity* (1855) are not likely to be soon superseded. Among Milman's other works were the *Martyr of Antioch* (1822), a tragedy, some unfinished *Annals of St. Paul's Cathedral*, various essays and hymns.

Milne, SIR DAVID, naval officer, born at Musselburgh in 1763, entered the navy in 1779. In 1800, after one of the most magnificent actions of the war, he captured the *Vengeance*. He became rear-admiral in 1814, and in 1816 he assumed the chief command in North America, but before leaving for his station he was allowed to go as second in command with Lord Exmouth's expedition to Algiers; for his share in the bombardment he was made a K.C.B. He was made vice-admiral in 1825, G.C.B. in 1840, and admiral in 1841, and up to within a few days of his death in 1845 he was commander-in-chief at Devonport.

Milne-Edwards, HENRI (1800-85), zoologist, was born at Bruges of English parents. He was appointed professor of entomology at the Jardin des Plantes in 1841, and professor of physiology and zoology in 1844.

Milner, Viscount, born 1854, was educated at Oxford, and called to the Bar. From 1882-5 he was mainly devoted to journalism, but in 1887 became Mr. Goschen's private secretary. From 1889-92 he was Under-Secretary for Finance in Egypt, and from 1892-97 Chairman of the Board of Inland Revenue. In that year he was appointed Governor of Cape Colony and High Commissioner of South Africa, and played a leading part in the negotiations of 1899 which terminated in the war with the South African Republics. Sir A. Milner was made Governor of the two annexed countries, and was raised to the Peerage in 1901, and after the conclusion of peace in May, 1902, he was made a Viscount. On the resignation of Mr. Chamberlain in 1903 he was offered the Colonial Secretaryship, but declined it. In 1905 he resigned his post as Governor, and was succeeded by Lord Selborne.

Milner, ISAAC (1751-1820), and **JOSEPH** (1744-97), two brothers, clergymen of the Evangelical school, and joint authors of *A History of the Church of Christ*, which no longer enjoys its former repute. Joseph was for many years head-master of Hull grammar school, and in 1797 became vicar of Holy Trinity Church. Isaac was appointed Dean of Carlisle in 1791.

Milo, a famous athlete, born at Crotona, in Magna Græcia, lived towards the close of the 6th century B.C. He was several times crowned for

victories in wrestling at the Olympic and Pythian games, and performed many marvellous feats. In 511 B.C. he led an expedition against the Sybarites.

Miltiades, an Athenian general, hereditary tyrant of the Thracian Chersonese, accompanied Darius Hystaspes against the Scythians, but afterwards incurred his enmity and fled to Athens. Here he was elected one of the ten generals, and during his term of command inflicted a crushing defeat at Marathon (q.v.) on the Persian host led by Datis and Artaphernes. In consequence of an unauthorised attack on the island of Paros he was thrown into prison, where he died of a wound received in the expedition.

Milton, JOHN, was born in Bread Street, Cheapside, on the 9th December, 1608. His father, a scrivener, was a man of enough education to enter into his son's ambition, and it was by his support that the latter was able to adopt a life of study. From the first the lad applied himself industriously to work. While at St. Paul's school he produced his first attempts in poetry, paraphrases of Psalms cxiv. and cxxxvi. From 1625 until 1632 he was at Christ's College, Cambridge, gaining a knowledge of Hebrew, French, and Italian in addition to the ordinary classics. To this period belong many of his Latin poems, and several of his English—notably *On the Death of a Fair Infant*, *On the Morning of Christ's Nativity*, *The Passion*, and *On Shakespeare*. On leaving the university he lived for nearly six years at Horton, in Buckinghamshire, whither his father had retired. There he wrote *L'Allegro* and *Il Penseroso*, *Arcades*, *At a Solemn Music*, *On Time*, and the pastoral masque known since his death as *Comus*. The two poems *To the Nightingale* and *Upon the Circumcision* belong also to the Cambridge or the Horton period. In these early poems Milton, although giving proof of deep religious conviction, still showed himself capable of appreciating the lighter sides of life. His greater work, for which he began consciously to prepare himself, was not to be carried out until years of political and sectarian strife had left their mark upon his character. In 1637 he wrote *Lycidas*, as his contribution to a volume published at Cambridge in honour of Edward King, who had been drowned in crossing to Ireland. Early in the next year he went to Italy as far as Naples, where he visited Manso, the friend of Tasso. He had intended to see Greece, but the news of the Puritan resistance to the king made him consider it was base for him to be cultivating his intellect abroad at such a time. Accordingly he turned back, but lingered at Rome, Florence, and Venice. The most interesting incident of his tour was his intercourse at Florence with Galileo, then old and blind, the prisoner of the Inquisition, an acquaintance which made a deep impression on his mind. Meanwhile, his closest friend, Charles Diodati, had died, in whose memory he wrote a fine Latin poem, *Epitaphium Damonis*. In it he mentions, as he had already mentioned in a poem to Manso, that he was meditating an epic on King Arthur, which, however, came to nothing. For the next two or three years

he was casting about for a subject on which to make a great effort. There exists a list in his writing of nearly a hundred subjects, among which *Paradise Lost* is sketched as a tragedy. During this time he lived in Aldersgate teaching his nephews and a few other boys on the system propounded in 1644 in his tractate *Of Education*. In 1643 his marriage with Mary Powell, the daughter of a strong Royalist, led to a curious episode. His wife, soon after the marriage, went back to her old home, and declined to return to her husband, who at this time published an anonymous pamphlet on divorce, alleging that incompatibility of temper is a ground for separation. In the spring of 1644 he brought out a second edition, adding his name and a dedication to Parliament and the General Assembly. He was charged with having published this without official license, whereupon he printed, unlicensed and unregistered, *Areopagitica*, an argument addressed to Parliament in favour of freedom of the press. In 1645 he was reconciled to his wife, and in 1646 he brought out a volume of his early poems. After the execution of the king he was made Latin secretary to the Council of State, with the duty of writing letters to foreign courts, and of holding interviews with foreign agents. This post he kept through Cromwell's rule. Meanwhile he was busy in the warfare of pamphlets, deserting poetry for what he considered a call of duty. Amongst his publications were *Eikonoklastes*, in answer to the Royalist *Eikon Basilike*, and a reply to a defence of the king by Salmasius, in which he displayed a ferocity of language only less than that with which he afterwards assailed Morus, to whom he erroneously ascribed the authorship of a similar production. A worthier example of his resentment was the sonnet of 1655 on the massacre of the Vaudois Protestants. His private life during this time was not happy. Working for the state with the knowledge that he was ruining his eyesight, he became blind in 1652, in which year his wife and son died. He lived with his three daughters until 1656, when he married Katharine Woodcock, who died fifteen months later. On the death of Cromwell he sought to stem by his pamphlets the reaction in favour of monarchy, but on the Restoration he was left unharmed. In 1663 he married Elizabeth Minshull. In 1658 he had begun *Paradise Lost*, which was published in 1667, and followed four years later by *Paradise Regained* and *Samson Agonistes*. Between 1669 and 1673 he also published a *Latin Grammar*, a *History of Britain before the Conquest*, and a book on logic. He died on the 8th November, 1674, and was buried in St. Giles' Church, Cripple-gate. His literary life falls into three strongly-marked divisions—first, an early poetic period, ending with his tour abroad; secondly, twenty years, except for the composition of a few sonnets, almost exclusively devoted to prose; and finally, the years in which his epics were composed. In majesty of diction, alike in prose and verse, as well as in strenuousness of moral effort, he is without a rival among English writers.

Milwaukee, the largest city of Wisconsin,

United States, stands on the Western shore of Lake Michigan, at the mouth of the river Milwaukee, 85 miles N. of Chicago. Its progress has been largely due to the water power of the river, which is joined about half a mile above its mouth by the Menomonee. The harbour has been much improved, and is now one of the finest on the chain of lakes, with docks extending 20 miles. Several railways converge at Milwaukee, and it is an important centre of the lake navigation. Engines, machines, and iron and brass wares are manufactured, but the chief industry is the trade in corn and provisions. The population is very largely of German origin.

Mimes, mimic actors, performers in the old Greek, Italian, and Sicilian low comedies called mimes. Some specimens of mimes by one Herondas have lately been discovered. In Sicily and Italy action and movement were special features of these dramas, so that in some [PANTOMIMES] speech was altogether dispensed with.

Mimicry, a term introduced by Bates in 1862 to denote that close external likeness which causes animals quite distinct to be mistaken for each other. The fact of such resemblances among British and European insects had long been known, and had found expression in specific and popular names, e.g. *crabroniformis* (resembling a hornet), Hornet-moths, Wasp-flies, etc., but no theory as to the reason of such resemblances was advanced. While exploring the Amazon Bates noticed that the butterflies of the families Heliconidæ and Danaidæ were closely mimicked by some of those of the family Pieridæ, and that this resemblance was general, not special—i.e. that the Pieridæ resembled other (not new) species of the other families inhabiting the same locality. He observed (and in this he was confirmed by Wallace) that the mimicked families were not attacked by birds, lizards, or insects; and in his famous paper on the subject he laid down the two propositions: (1) That the form mimicked has some special protection (as a nauseous taste or smell), or some means of defence (as a sting), and (2) that it is more abundant than the mimickers, which are eatable and defenceless. When more material had been accumulated, Wallace formulated laws adopting Bates's propositions, and adding the following: (1) That the areas inhabited by mimickers and mimicked are the same, (2) that the mimickers differ from the bulk of their allies, and somewhat simplified Bates's definition as to the resemblance being only external. These laws were based on observations made on insects, and to them only do they in strictness apply. But mimicry exists among much higher animals, and the general principle is the same—that of protection of some kind. The colouring of the venomous *Elaps* of Mexico is mimicked by the innocuous *Pliocercus*, with the same habitat. Our own cuckoo mimicks the plumage of the hawk, and one genus is called Hawk-Cuckoo; and the resemblance of the Aardwolf (*Proteles lalandii*) to the Striped Hyena is probably a case of protective mimicry. It must be remembered that the term "mimicry" implies no conscious imitation, and Wallace believes

that the resemblances arose by means of natural selection. But since Bates and Wallace wrote, other investigators have carried the matter farther, as will be seen from the following scheme of animal coloration condensed from the paper of Mr. Poulton, F.R.S., read before the British Association at Leeds in 1890:—

- I. CRYPTIC COLOURS (for concealment).
 1. PROCRYPTIC (protective). The green pipe-fish is well concealed among *zostera* leaves, but conspicuous in clear water.
 2. ANTICRYPTIC (aggressive). The South American horned frog buries itself in the earth, with the colour of which it harmonises, and seizes small animals as they approach.
 3. ALLOCRYPTIC (protective and aggressive). Small crabs deck themselves with seaweed.
- II. SEMATIC COLOURS (warning and signalling).
 1. APOSEMATIC. The brilliant coloration of nauseous insects and the black-and-white coloration of skunks (which emit an intolerable stench).
 2. EPISEMATIC (serving for recognition). The white scut of the rabbit and the white marks on the hind-quarters of deer and antelopes.
 3. ALLOSEMATIC (in which the warning colour or noxious quality belongs to another animal). Hermit crabs protect themselves by having sea anemones as commensals.

He then defines mimicry as "false warning or signalling colours, repelling enemies by the deceptive suggestion of some unpleasant or dangerous quality, or attracting prey by the deceptive appearance of something attractive to them." Even foreign objects commonly associated with some well-defended and aggressive species may be mimicked by a comparatively defenceless form.

1. PSEUDAPOSEMATIC (protective). The mimicry of Bates and Wallace as described above.
2. PSEUDEPISEMATIC (aggressive and alluring). The flies of the genus *Volucella* so closely resemble humble-bees that they lay their eggs in the nests of the latter insects without detection, and their larvæ feed on those of the bees. The angler-fish, which attracts other fish by its mouth filaments, is an example of alluring mimicry.
3. PSEUDALLOSEMATIC (the use of foreign objects for concealment). Mr. W. L. Slater (*Proceedings of the Zoological Society*, 1891, p. 462) records the fact that an immature homopterous insect in South America mimics the leaf-carrying ant and the leaf it carries.

Mimosa, a large genus of Leguminosæ, the type of the sub-order Mimosæ, including some 200 species, almost all tropical and mostly American. They are herbs, under-shrubs, shrubs, or climbers, with bi-pinnate leaves, which have generally numerous small leaflets, and are sensitive. Many species are prickly. They have small, poly-symmetric flowers, with five sepals, five petals, and not more than ten stamens. *M. pudica* and *M. albida* are the most commonly-cultivated sensitive plants. [SENSITIVE PLANTS, SLEEP IN PLANTS.]

Mimosa Bark and Extract. [WATTLE.]

Mina, Minah. [MYNA.]

Minaret, a slender turret or tower, with balconies projecting at intervals, rising above a Mohammedan mosque. From these balconies the people are summoned to pray five times a day by persons called *muezzins* (q.v.).

Minas Geraes, a province of south Brazil, lying to the N. of Rio de Janeiro, and separated from the coast by Espirito Santo. Its surface is composed

mainly of high table-land, much of which belongs to the Serra do Espinhaço and its spurs; the highest point of the range is the Pico de Statlaissu, over 6,000 ft. Herds of cattle graze on the wide prairies, and in the E. there are extensive coffee plantations. There are diamond, gold, iron, and other mines. The capital, Ouro Preto, was founded in 1699.

Minden, a Prussian town in Westphalia, on the Weser, 35 miles W. of Hanover. The recently-restored Roman Catholic church, ranging in date from the 11th to the 14th century, was formerly a cathedral. The new bridge (1874) is 600 ft. long and 24 ft. broad. Minden has tobacco and other manufactures, and a large trade by the river. Here an army under Ferdinand of Brunswick and Lord George Sackville defeated the French in 1759.

Mine (NAVAL), a case, usually of iron or steel, which being charged with explosive material can be sunk or submerged in a ship channel in such manner as to endanger any hostile vessel that may attempt to pass over it. A mine may be arranged to be discharged by electricity transmitted by means of a cable from an observation station on shore or ship-board, or by the striking against it of any heavy body. Mines which are not moored, but which are allowed to drift, are towed, are automobile, or are by any method taken or sent through the water expressly to do this work, are known as torpedoes. The explosive commonly used in British service mines of all classes is gun-cotton. [MINING.]

Mineralogy is the science of minerals. A *mineral* may be defined as a natural, homogeneous, inorganic substance, this definition excluding the artificial compounds of the laboratory, heterogeneous substances (such as are many rocks), and organic substances (such as pearl, amber, or coal). Most minerals, though containing inconstant impurities, have a definite chemical composition, expressible in a formula; and, though often occurring in indefinite ungeometrical shapes, have also a definite crystalline form. Chemical analysis and crystallography (q.v.) thus afford the chief means of identifying minerals; but, in addition to form and composition, minerals have other distinctive characters, optical, thermal, electrical, magnetic, aggregational, etc. Among the *irregular* or *indeterminate* forms of minerals are the *nodular*, with irregularly-rounded surfaces, as in flint (q.v.); the *mammillary* or *botryoidal*, with spheroidal prominences, as in malachite (q.v.) and kidney iron-ore; the *stalactitic*, or icicle-like cylindric masses, as in calcite (q.v.); and the *dendritic*, tree-like, or mossy, as in pyrolusite. Cleavage is an important character closely related to crystalline form. [CRYSTAL.] The chief optical characters of minerals are transparency, refraction, polarisation, lustre, colour, streak, and phosphorescence (q.v.). Transparency, or diaphaneity, the power of transmitting light, is of five degrees—*transparent*, transmitting distinct outlines; *sub-transparent*, when they are indistinct; *translucent*, transmitting light only; *sub-translucent*, or translucent when very thin; and *opaque*. Refraction (q.v.) is also closely related to crystalline form, and polarisation (q.v.) and lustre (q.v.) depend

mainly upon refraction. Colour sometimes presents so wide a range within the limits of one mineral species as to be of little discriminative value; but streak, the colour of the mineral when abraded, is more useful. Among other optical characters often very distinctive are dichroism (q.v.) and fluorescence (q.v.). Thermal, electric, and magnetic conductivity are not much employed by the mineralogist in diagnosis; but are connected with the crystalline system. The pyro-electric polarity of crystals of tourmaline, topaz, boracite, and other hemihedral forms, which causes them to reverse their electric character as they are heated, is important; and some minerals, such as lodestone (q.v.), are notably magnetic. Fusibility is measured by a scale of comparison drawn up by Von Kobell, in which antimonite, fusible in a candle-flame, is 1; natrolite, slightly so, 2; almandine-garnet, requiring a blow-pipe, 3; actinolite, only fusible in thin splinters, 4; orthoclase, fusible with difficulty, 5; and bronzite, very infusible, is 6. The aggregational characters of minerals include (1) their molecular rigidity, whether gaseous, liquid, or solid; (2) their tenacity, including sectility or capability of being cut with a knife, malleability or capability of being beaten into foil, ductility or capability of being drawn into wire, flexibility, the property of bending, elasticity, that of springing back again when bent, and brittleness; (3) their fracture; and (4) their hardness (q.v.). The surfaces of fracture, whether conchoidal, or shell-like, as in flint, splintery, as in chert, or hackly, as in cast-iron, are sometimes characteristic. Other characters of minerals are their specific gravity (q.v.), which is generally compared to that of water at 60° Fahr., or 4° C., touch, taste, and odour. The soapy or greasy touch of many magnesian minerals, especially hydrous silicates, is characteristic. [SOAPSTONE.] Taste is necessarily confined to soluble, odour to volatile minerals. The chief tastes are named as saline, in common salt; alkaline, in soda; cooling, in nitre; astringent, in the vitriols; sweetish astringent, in alum; and bitter, in Epsom salts (q.v.). Among the chief odours are the foetid smell of sulphuretted hydrogen given off by some limestone [STINKSTEIN], and the argillaceous, or earthy smell of clays and serpentine when moistened.

Of these characters, chemical composition is mainly employed in the classification of minerals. The several thousand species of minerals which have been described, the vast majority of which are rare substances of no commercial or even geological importance, are grouped into five main divisions. These are (1) native elements, subdivided into the metals and the non-metals, (2) sulphides, arsenides, etc., (3) chlorides and fluorides, (4) oxides, and (5) (by far the largest division) oxygen salts. This last is subdivided into some seven classes:—(1) carbonates, (2) silicates, (3) tungstates, etc., (4) sulphates and chromates, (5) borates, (6) nitrates, and (7) phosphates, arseniates, etc.

Mineral Veins, or **LODES**, seem to have been originally fissures, the sides or *cheeks* of which have been coated with successive layers of minerals. These do not always completely fill the fissure; but

In other cases the vein has been reopened alongside of a former infilling. Veins vary in width from less than an inch up to 150 feet or more. They occur especially among igneous and metamorphic rocks, and there is a curious relation between the nature of the *country rock*, as the rock traversed is termed, and the contents of the vein. Thus in Cornwall one set of parallel and contemporaneous lodes running east and west contain tin-ore where they traverse granite, and copper-ore where they are in slate ("killas"); and another set, running north and south, and of a later date, yield lead and iron-ores. The minerals most commonly found in veins are the non-metalliferous *vein-stones*, quartz, calcite, baryte, and fluor, and the *ores*, such as galena, blende, cassiterite, pyrites, native copper, and gold. Though they have occasionally communicated with the surface so as to allow of pebbles and land-shells being washed down into them, veins seem generally to have been filled from below by deposits from heated solutions.

Mineral Waters, *i.e.* waters containing dissolved in them a greater or less amount of gaseous or mineral matter, have been known and prized since early times. Evidences of their use by the Romans are seen at Bath, Aachen, and many other localities, whilst references to them occur in the writings of Pliny, Hippocrates, and Homer. The source of these waters is usually the rain, which dissolves out some of the constituents of the soils through which it percolates, so that the characteristics of the water are dependent upon the geological strata of the district. Many of the mineral waters possess undoubted medicinal value, which, however, is frequently overlooked owing to the assumption of almost universal healing power. The course of treatment adopted at most spas and wells is that of baths and drinking. The water is usually drunk in the morning before breakfast, and the baths taken during the forenoon, moderate exercise and strict dietary regulations being usually also insisted on. Treatment should always be only taken under medical advice, as indiscriminate drinking, etc., can only lead to injurious effects. The mineral waters may be divided into the following classes:—

(1) *Thermal*, where the springs have a high temperature, but contain few dissolved minerals, *e.g.* the thermal waters of Bath, Buxton, etc.

(2) *Saline*, characterised by the presence of common salt, as the waters at Droitwich, Nantwich, Harrogate, Cheltenham, Leamington, Baden-Baden, Kissingen, and Homburg.

(3) *Alkaline*, in which the carbonate of the alkaline metals (sodium, potassium, or lithium) are present, and usually also carbonic acid gas. Examples of such waters are found at Mont Dore, Vichy, Apollinaris, Ems, and other places.

(4) *Sulphated saline*, in which the chief mineral substances are the sulphates of sodium or magnesium, accompanied usually by common salt and soda. In this country, Leamington, Scarborough, Cheltenham, are well known for such waters, while on the Continent Carlsbad, Hunyadi, Seidlitz, Friedrichshall, etc., have acquired notoriety.

(5) *Chalybeate*, containing dissolved salts of iron.

They have an inky taste and occur among other places at Harrogate, Tunbridge, Llandrindod, Godesberg, Spa.

(6) *Sulphur*, whose characteristic feature is the presence of free or partly combined sulphuretted hydrogen, which imparts to the water the odour of rotten eggs. Well known localities of such springs are Harrogate, Llandrindod, Bülth, Aachen, Aix-les-Bains, Engheim, Baden, etc.

(7) *Calcareous*, or earthy, which contain the carbonate of calcium and magnesium, or sulphate of calcium, as the waters of Buxton, St. Arnaud, Taunus.

Aërated waters with or without the addition of minerals, or flavoured by fruit essences, are also known as mineral waters. The manufacture of such beverages has now become a most important industry. In these cases the flavouring material, *e.g.* essence of lemons, raspberry, pear, orange, etc., or the mineral material, is first added to the water, which is bottled and then strongly charged with carbonic acid gas, pumped in under strong pressure by suitable machinery.

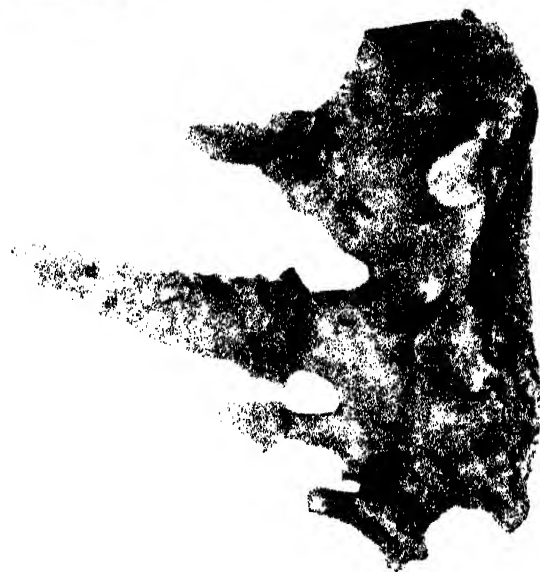
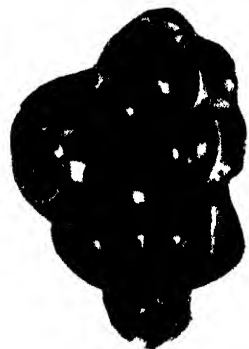
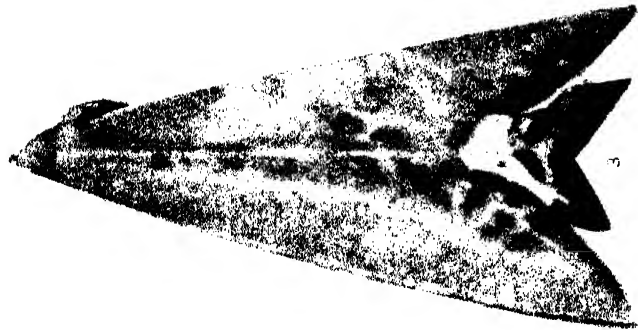
Minerva, a Roman goddess, probably of Etruscan origin, who subsequently became identified with the Greek Athene (q.v.). Her name is probably derived from the same root as *mens*, and she was the goddess of "mind" in the widest sense—not merely the patroness of poetry and medicine, of all art, science, and handicraft, but the originator of every subtle thought and heroic impulse. She had temples on the Capitol, the Aventine, and the Coelian Hill. Her festival, the *Quinquatrus*, was celebrated March 19–23, and the lesser *Quinquatrus* June 13–15.

Minghetti, MARCO (1818–86), Italian statesman, was born of a rich merchant family at Bologna. In his youth he travelled in France, Germany, and Great Britain, paying special attention to agricultural economics. After holding office in the short-lived Liberal Ministry of Pius IX. (1848), he entered the service of Charles Albert of Sardinia, and became the intimate friend and supporter of Cavour (q.v.), whose work he carried on after the death of the latter in 1861. He was Minister of the Interior under Cavour in 1860, President of the Council and Minister of Finance 1863–68, came to London as ambassador in 1868 and was again Prime Minister in 1873–76. He published *Della Economia Pubblica* (1859), and other works.

Miniature, in *minium*, or vermilion, used chiefly in illuminating books; hence an illumination or other painting on a small scale, especially a portrait, hence anything small or on a small scale.

Minim, in music, a note equal in time-value to one-half of a semibreve. In early mediæval music it was the shortest note used. In chemistry the minim is one-sixtieth part of a fluid drachm, and is regarded as about equal to one average drop.

Mining. The art of mining consists of those processes whose object is to find useful minerals, and extract them from below the surface of the earth. Mines are generally classified by legal



MINERALS.

1. CALCITE (FROM MEXICO): EXAMPLE OF GLOBULAR STRUCTURE.
2. JASPER (FROM URAL MOUNTAINS).
3. GYPSUM (FROM PARIS): EXAMPLE OF DENDRITIC STRUCTURE.
4. PYROLUSITE (MANGANESE OXIDE) ON LITHOGRAPHIC STONE FROM BAVARIA: EXAMPLE OF STALACTITIC STRUCTURE.
5. MALACHITE (TYROL): EXAMPLE OF NODULAR STRUCTURE.
6. CALCITE (FROM DERBYSHIRE): EXAMPLE OF RADIATED AND GLOBULAR STRUCTURE.
7. WAVELITE (FROM TRACTON ABBEY, CO. CORK): EXAMPLE OF CRYSTALS, SUR-TRANSPARENT.
8. CALCITE (FROM DERBYSHIRE): EXAMPLE OF CRYSTALS, SUR-TRANSPARENT.

enactment according to the deposits contained in them; but this classification varies in different countries. The question of ownership, too, receives different solutions in different parts of the world. In Great Britain the possessor of freehold land usually owns all the mines beneath; but special cases often occur in which mines in the land at different depths belong to different people. Mineral deposits may be divided into two kinds:—(1) tabular deposits, including *beds* of stratified material and *veins* of mineral ores. Beds are usually of aqueous origin, while veins may occur in either igneous or aqueous rocks, and are often formed by the filling up of a crack or fissure in the rock by a different mineral. (2) Masses, generally of irregular shape and of igneous origin; they are never stratified. Both kinds of deposit may have suffered partial displacements, or *faults*, the result being the same as if the bed or mass of rock had been split and then one-half of the deposit moved away from the other along the split. In prospecting for minerals, attention is paid to the geology of the district, a great deal of information being obtained from the faces of cliffs, beds of rivers, railway cuttings, etc. Fragments of minerals are looked for on the ground, and special search is made for any outcrop of the bed or vein itself. If the bed crops out, then exploratory workings are often made at the surface; otherwise boring is resorted to. A small hole is made in the deposit by means of a cutting tool fixed to the end of a rod. As the hole gets deeper, other rods of equal length are attached to the first and are raised into a tower, whose height is equal to the length of one rod, from which they are again sent down into the hole. The *débris* caused at the bottom is cleared away by other tools. To avoid loss of time in connecting and disconnecting the rods when the hole gets deep, a rope is often employed, and more recently a diamond drill has been used to make an annular cutting—the column of rock, etc., left in the centre being removed from time to time. If the boring shows that the deposit is worth working, excavations are made, the process of “breaking ground,” as it is called, being varied according to the nature of the ground. Soft earth is removed by the shovel or pick, but hard rocks are removed by boring or blasting. Gunpowder, nitro-glycerine, and special gun-cotton are used for blasting, the charge being fired by a safety fuse or by electricity. Machine drills for boring the hole before blasting have been immensely improved of late years, and differ greatly in design. Horizontal passages, or “levels,” are made by alternately boring holes and then blasting, and the same is done in the making of more or less vertical pits or shafts. The passages and pits are secured against collapse by timber or iron props, or by some sort of masonry. The vein of mineral is reached by a suitable arrangement of levels and shafts depending on the inclination of the vein, and the mineral itself is worked away in a series of steps. As the miner cuts away a few steps, the ore is drawn into the level from which he is working, and the rubbish is put on one side; or he may cut steps down from one level to another, and the ore

rolls into the lowest one, at the bottom of a shaft or “winze” specially cut there, and up which it is afterwards drawn. Sometimes the roof of a level is excavated, the men erecting platforms upon the rubbish from one part, to enable them to work higher. In coal-mines where large beds of mineral are to be worked, pillars of coal are often left to support the roof of the mine, and this is known as the “port and stall” or pillar system; or the coal is wholly removed from the faces of roads, generally parallel to each other, the roof being supported by props. This is known as the long well system. Other excavations have to be made in very watery ground; a water-tight lining or “tubbing” is often added to the shaft, or in some cases the water can be drained away by a level or “adit.” The ventilation of mines is of great importance, owing to the noxious gases which often escape from the deposits; and, owing to the inflammability of many such gases, care is used in the system of lighting employed. Where no inflammable gases are evolved, torches, candles, and electricity are used; but in coal-mines special safety-lamps are employed. The mineral excavated is generally conveyed along the level in wheelbarrows or trollies to the bottom of a shaft, where it is raised by machinery, either in buckets or large cages, the latter often serving to convey the miners as well. *Military Mining*, i.e. the excavation of underground passages in which explosives are lodged so as to destroy the enemy's works. Forms an important branch of modern warfare.

Minium, a term originally applied to both cinnabar and red-lead, the two pigments being incompletely distinguished; when, however, the distinction between them was understood, it became confined to red-lead. It is extensively used as a pigment, and in the production of porcelain and flint-glass. [LEAD.]

Mink, a popular name for a partially aquatic species of the genus *Putorius*, from the northern parts



MINK. (*Putorius lutreola*.)

of both hemispheres. They are closely allied to the weasels, which they resemble in form, though of much larger size. *P. lutreola* is the European, and

P. vison the American Mink. The rich brown fur of both is valuable, and for its good qualities as a rather the American form is largely bred. *P. sibericus*, the vison from Siberia, seems to link these forms with polecats.

Minneapolis, the largest city of Minnesota, United States, is situated on both banks of the Mississippi, eight miles W. by N. of the capital, St. Paul. The original town stood on the right bank, but St. Antony, on the opposite side, was incorporated with it in 1873. The prosperity of Minneapolis is mainly due to the water-power furnished by the river, which falls about 80 feet as it passes through, with an abrupt descent of 16 feet at the falls of St. Antony. The university is open to both sexes. The Government Loan buildings are an immense pile, with a garden on the roof. Flour-milling and saw-milling are the principal industries.

Minnesingers, German minstrels and poets of the 12th and 13th centuries, called "singers of love," from the fact that love was a favourite subject with them. They were usually of noble descent and sang in the Suabian dialect.

Minnesota, one of the United States, bounded by Canada on the N., Dakota on the W., Lake Superior and Wisconsin on the E., and Iowa on the S.; area 83,365 square miles. The table-land in the N.E. rises to a height of 1,360 feet; the lowest elevation at the S.E. extremity is 660 feet above the sea-level. The south portion of the state consists entirely of prairie, but north-east of the Mississippi runs a broad belt of white pines, and in the north-east portion of the state there are extensive marshes, scantily covered with the tamarack and fir. Minnesota is the great watershed between the Gulf of Mexico and Hudson's Bay, and the Mississippi, Red River of the North, and St. Lawrence, all have their sources in its northern uplands. The Minnesota, one of the chief tributaries of the Mississippi, joins it between Minneapolis and St. Paul. Every part of the state is thickly studded with clear lakes, the largest being Red Lake, with an area of 530 square miles. Some of the best wheat in America is grown in Minnesota, and the oats and potatoes are also of good quality. The chief minerals are iron, and a peculiar kind of red clay or pipe-stone. St. Paul is the capital, and Minneapolis (q.v.) the largest town. Minnesota became a territory in 1849, and was admitted to the Union in 1858.

Minnow (*Leuciscus phoxinus*), a small fish of the Carp family, widely distributed in rivers and streams of Britain and the Continent. English specimens are rarely more than three inches long; but, according to Dr. Günther, in favourable localities this fish may reach a length of seven inches. The colour above is dusky olive, with dark spots, lighter on the sides, and white on the belly, which is rose-tinted in spawning time. Minnows prefer clear, shallow streams, and in winter hide under stones and overhanging banks. They feed on aquatic vegetation, insects and their larvæ, worms, and molluscs; and in times of scarcity the stronger prey upon the weaker, while large fish prey upon the minnows.

They are esteemed for food, and are taken with a hand-net; they furnish excellent bait.

Minorca, the most easterly of the Balearic Islands (q.v.), and the second in size. It is 22 miles N.E. of Majorca, and has an area of 284 square miles. The coast is rugged, and, except on the south side, much indented, the finest inlet being that which forms the harbour of Port Mahon. The surface rises gradually to the central point, Mount El Toro (4,793 feet). It belonged at one time to England.

Minos, a mythical King of Crete, the legends concerning whom were a relic of the Phœnician occupation. In Greek mythology he appears as the son of Zeus and Europa. He was said to have enacted a code of laws communicated to him by Zeus himself, and to have become after his death the judge of the nether world.

Minotaur, a fabulous monster, supposed to have had a human body and the head of a bull. He was confined in the Cretan labyrinth, and lived on human flesh. He was killed by Theseus, son of Ægeus, King of Athens, who volunteered to be one of the seven youths and seven maidens whom Minos, King of Crete, compelled the Athenians to send yearly to be devoured by this monster.

Minsk, a government of west Russia, S. of Vilna, with an area of 35,282 square miles, three-fourths of which are swamp, forest, and moor. MINSK, the capital, is situated on an affluent of the Beresina, 430 miles S.W. of St. Petersburg

Mint (*Mentha*), a genus of Labiatae (q.v.), natives of sub-tropical and temperate regions, the number of species being indeterminate owing to variation and hybridism. They have square stems; opposite, aromatic leaves; small flowers in verticillasters (q.v.), often crowded into terminal spikes; and pale, sub-equal, corolla-lobes. Among British species are *M. viridis* (Spearmint), used for sauce; *M. Piperita* (Peppermint), cultivated for its volatile oil; and *M. Pulegium* (Pennyroyal), employed in female disorders. The steareptene, or camphor, dissolved in the volatile oil of varieties of *M. arvensis*, is the *menthol*, or *Chinese oil of peppermint*, now largely used for neuralgia.

Mint, a place set apart for the coining of money. There used to be many mints in England; now all good money is coined in the Mint, Tower Hill, London, which is an extensive establishment, the privilege of coining being a royal prerogative.

Minto, GILBERT ELLIOT, 1ST EARL OF (1751-1814), Governor-General of India, was educated at Oxford, and called to the bar in 1774. He entered Parliament in 1776, and was Viceroy of Corsica 1794 to 1796, and envoy-extraordinary to Vienna in 1801. The chief events of his Indian Viceroyalty were the consolidation of the British power, the conquest of Bourbon and the Mauritius from the French (1810), the capture of Java (1811), and the opening of diplomatic relations with Persia, Afghanistan, and the Punjaub.

Minuet, a graceful and dignified figure-dance in slow triple time, invented about the middle of the 17th century, which retained its popularity in England for about a hundred years.

Miocene (Greek *meion*, "less"; *kainos*, "recent"), a system of Tertiary rocks, named from the fact that less than 50 per cent. of its Mollusca belong to species still living. The system is unrepresented in Britain (unless by some of the Mull and Antrim basalts), which was probably dry land during the Miocene period. Much of Europe seems to have been covered by large lakes and shallow arms of the sea, in which were deposited the sandy marls of the "Faluns" of Touraine and the sandstones, conglomerates, and lignites of the Swiss "molasse." The Oeningen beds in the latter have yielded abundant fossils, especially plants. Tropical palms, figs, acacias, and myrtles seem during this period to have gradually given place to the more temperate poplar, hornbeam, and birch. The small three-toed horse *Anchitherium*, the earliest bear, *Hyænarcos*, the sabre-toothed tiger, *Machærodus* (q.v.), *Deinotherium* (q.v.), and *Mastodon* among proboscideans, with the rhinoceros, deer, and true apes are the most characteristic mammals of the Miocene.

Mirabeau, HONORÉ GABRIEL RIQUETTI, COMTE DE (1749-91), one of the greatest of French statesmen, was educated for the army at a Paris *pension*, and here he already began to display those social gifts which, in spite of his ugliness, gave him an almost miraculous power over the wills and affections of men. On obtaining his commission he was sent to the little town of Saintes, where he became entangled in the first of his disastrous love affairs, and was in consequence imprisoned by *lettre de cachet* (q.v.) in the Île de Ré. His father relented after a while, and allowed him to join the expedition to Corsica against Paoli. After his return he consented to marry a rich heiress (1772); but his extravagance and unruly conduct caused a fresh estrangement, and he was imprisoned successively in the Château d'If and the castle of Joux, where he formed a connection with the wife of a citizen of Pontarlier, with whom he fled to Switzerland, and thence to Holland; but in 1777 he was seized and condemned to solitary confinement in the castle of Vincennes. Here he wrote his brochure on *Lettres de Cachet*, a far more powerful work than the previous *Essai sur le Despotisme* (1774). After his release (1780), failing to obtain a restitution of his conjugal rights, he formed a new connection with a Madame de Nehra, who seems to have exercised a wholesome influence over him. He now turned to literature as a means of gaining a livelihood, and visited Holland and England, where, through his old friend Sir Gilbert Elliot (afterwards Lord Minto), he became intimate with Romilly, Lord Lansdowne, and other public men. In 1786 he was sent on a secret mission to the Prussian court, and while there obtained materials for his *Monarchie Prussienne* (1788). In 1789 the States-General was summoned, and the Revolution began. Mirabeau was elected deputy by the *tiers-état* of both Aix and Marseilles, and preferred to sit for the former. His rhetorical powers at once gained

him a hearing in the Assembly; but his ascendancy, though great, was not paramount. He could not check the reckless enthusiasm which found vent in the destructive legislation of August 4th, or raise the apathy which was content to waste two precious months in discussing the wording of the "Declaration of the Rights of Man." Soon after the disturbances of October 5-6 he was invited by his friend the Count de la Marck, a trusted counsellor of Marie Antoinette, to draw up a *Mémoire* for the king's guidance. In this document his constitutional views were clearly set forth, but Louis could not understand his aims. The queen was averse to any course which seemed to threaten a limitation of the royal prerogative, and his design of a representative ministry was frustrated by a decree of the Assembly enacting that none of its members could become a minister (November 7). Five months later, however, the queen again sought his advice, and from this time forward he occupied an unofficial and anomalous, but recognised position at court, although the queen always disliked him and only had recourse to his counsel as a last resort. His support of the king's prerogative in regard to the veto and right of declaring peace and war did not increase his popularity; but his influence in the Assembly remained sufficiently strong to afford a very substantial bulwark of the royal power. He was the real author of the foreign policy of Montmorin, the purpose of which was to prevent all interference with the course of the Revolution on the part of foreign nations. But towards the end of 1790 his health, undermined by his youthful excesses, gave way, and he died on April 2, 1791.

Miracle, a wonderful occurrence or phenomenon. In theology, a manifestation of superhuman power, producing an effect which cannot reasonably be assigned to ordinary human agency or to any known natural cause. In the Middle Ages dramatic spectacles illustrative of Bible history were called miracles or mysteries.

Mirage, an optical illusion produced by refraction when adjacent layers of air have very different densities, and are consequently very different refracting mediums. On flat deserts, when the air nearer the ground is rarer than the air above, such excessive refraction produces the appearance of objects reflected in water, the actual objects being often quite hidden below the horizon. The phenomenon occurs at sea as well as on dry, level plains. Objects may appear not only displaced, doubled, or simply inverted, but also distorted and turned over from a vertical to a horizontal position. Inferior mirage furnishes a visible object with a reflection as if it were in or near water.

Mirror, MAGIC. In China and Japan small mirrors are nearly always made of metal, highly polished, and often slightly convex on their reflecting face, and with figures or signs in relief ornamenting the back. Some of these mirrors are found to exhibit a curious phenomenon, when a beam of light is reflected from the face on to a white screen. A more or less distinct image of the carving on the back of the mirror is produced. Such mirrors were termed "magic," and

have been for many centuries prized far more than the ordinary reflectors in those countries. This peculiarity has been found to be due to an irregularity in the convexity of the front face which is produced in the process of manufacture. The metal on the front face is cut by a tool which is not equally resisted by all parts of the mirror, the thin portions where there is no relief ornament bending in front of the tool, and then afterwards rebounding into a rather more convex form than the thicker parts assume. A strong beam of light is therefore unequally reflected from the different portions, and an image appears on the screen. It has further been found that if a mould be taken of the face of the mirror, and this be coated electrically with a thin piece of metal, the polished metal surface of the mould will throw the same image on the screen, proving that the face of the mirror is unevenly curved.

Miscarriage, the premature expulsion of the ovum occurring during the fourth, fifth, sixth, and seventh months of pregnancy. If pregnancy is interrupted and the ovum expelled during the first three months, the term *abortion* (q.v.) is used to denote such occurrence, while the expression *premature labour* is employed to designate the expulsion of the contents of the womb after the seventh, and before the ninth month of pregnancy. Any cause which produces death of the foetus leads to miscarriage; such causes are injury, disease of the decidua or of the foetal appendages, and separation of the decidua from the uterine walls. Again, miscarriage may result from a diseased condition primarily affecting the mother, such as certain fevers, syphilis, anæmia, etc. The symptoms of a threatened abortion or miscarriage are pain and hæmorrhage. If these symptoms occur in the course of pregnancy absolute rest in the recumbent position should be at once enforced, and professional advice procured without delay. Treatment of inevitable abortion is, of course, a matter for the medical attendant.

Misdemeanour is an act committed, or omitted, in breach of a law forbidding or commanding it. Crimes and misdemeanours are, however, comprehended under this general definition, though the former term "crimes" denotes such offences as are of a more serious and atrocious nature, while lesser faults and omissions are known by the milder term misdemeanours. In English law the term "misdemeanour" is used in contradistinction to felony, and comprises all indictable offences not amounting to felony—such as libels, conspiracies, attempts and solicitations to commit felonies, etc. [FELONY.]

Miserere, the name taken from the first word of the *Vulgate* of the fifty-first Psalm, used as a canticle in various liturgies, as in the Anglican and Latin burial services. Also a setting of this psalm to music—the most celebrated being that of Allegri—which is regularly performed in the Sistine Chapel at the Tenebræ service in Holy Week. The name is also given to a certain class of seats in church stalls.

Misericordia, the goddess of mercy or pity in post-classical Latin mythology.

Mishmi, a Tibeto-Burman people in the Mishmi Hills about the frontiers of Assam and Tibet, forming three main divisions: Midhi, Dagaru, and Meju, collectively called Nahong by the Tibetans. One group presents a striking resemblance to the Japanese lower classes, but all speak the same language, a rude, uncultivated Tibetan dialect, and most of the tribes have the flat features and yellowish colour common to all Mongolic peoples. Their religion is concerned mainly with the magic arts, and their priests, like the Siberian Shamans, exorcise the possessed and cure all ailments by their spells, contortions, dances and drum-beating. They are polygamists, and dwell in immense houses large enough to contain over a hundred persons under a single roof. In the barter trade everything is reckoned by the "head"—a reminiscence of the head-hunting period, when the heads of their victims served as currency. (T. T. Cooper, *The Mishmi Hills*; Dalton, *Ethnology of Bengal*.)

Mispickel, or ARSENICAL PYRITES, is a hard silver grey mineral which forms crystals of the rhombic system. It consists chemically of iron, sulphur, and arsenic (Fe_2AsS_2), but frequently contains also cobalt. It is used for the production of arsenic and arsenical compounds, being the chief source of these substances.

Missal, a mass-book in the Latin liturgy, consisting of a collection of several service-books. The greater portion of the contents is very ancient. The Roman Missal in its present form is substantially the Missal as revised under Pius V. and promulgated by him in 1570.

Missions, systematic expeditions or establishments for the spread of Christianity authorised by an ecclesiastical officer or a religious society. Celebrated missions are the sending of Augustine to England by Gregory the Great (597), the Jesuit missions in India, China, Japan, and South America, the missions of the Moravians or United Brethren, those of the Society for the Propagation of the Gospel in Foreign Parts (incorporated in 1698), and of the Church Missionary Society (established by the "Clapham sect" (q.v.), the nucleus of the Evangelical Party, in 1800). The term is applied also to a set of special services held occasionally for the awakening and comforting of baptised Christians under the conduct of a "missioner."

Mississippi. A river of North America, 2,960 miles in length, or, if the Missouri rather than the Upper Mississippi be regarded as the head-stream, 4,200 miles. With the exception of about 12,000 square miles drained by the Milk river and situated in British America, its basin of 1,257,545 square miles lies wholly within the United States. It rises in the state of Minnesota in lat. 47° 6' N., long. 95° 15' W., where several small streams unite to form Lake Itasca. It flows generally south, with a slight inclination towards the east; but in some parts its course is so involved that it almost returns upon itself. Its chief tributaries besides the Missouri (q.v.) are the St. Croix, Chippeway, Wisconsin, Illinois, and Ohio on the east, and the Minnesota, Iowa, Des Moines, Arkansas, and Red

River on the west. At first it passes, with numerous falls and rapids, through a wild and almost unexplored region of prairie, swamp, and pine-forest. In Wisconsin begin the bluffs which henceforward



MAP OF THE COURSE OF THE MISSISSIPPI.

frequently line its course, and below the influx of the Ohio sometimes rise abruptly to a height of 250 feet on the east bank; on the west bank they are less precipitous, and situated at a greater distance from the river, owing to the alluvial deposits brought down by the tributaries on this side, which form a plain varying from 30 to 150 miles in width. Below the Red River the stream divides into numerous channels, which find their way to the Gulf of Mexico through a marshy and

perfectly level district with but few inhabitants. New Orleans is situated near the mouth. The main channel is entered through several mouths at the end of a long tongue of land in long. 89° W. The floods produced by the spring rains and the melting of the snow in the upper basin extend from February to June. The surrounding country is now protected by embankments called "levees;" but between the Ohio and the Red River they are broken through at intervals of about ten years, when the water sometimes rises 50 feet, and the river frequently shifts its course permanently for some distance. In some places the surface, but not the bed of the river, is higher than that of the land in the neighbourhood. The Mississippi is navigable as far as Minneapolis, 2,160 miles above its mouth. The chief dangers of navigation, in addition to those caused by the falls and rapids (now averted by the construction of ship canals) are the "snags" and "sawyers," or trees carried down by the floods, and the vast deposits near the mouth which are constantly shifting their position; but a fixed channel, over 30 feet deep, is now secured through the jetties designed by Captain J. B. Eads.

Mississippi is the name of one of the United States, having Tennessee on the N., Alabama on the E., Arkansas and Louisiana on the W., Louisiana and the Gulf of Mexico on the S.; area 46,810 square miles. The Mississippi river skirts the west

border. A level tract, in which swamps alternate with prairies and pine-forests, stretches inland for 100 miles from the coast; elsewhere the surface consists for the most part of low hills or plateaus, except in the Yazoo Delta, which extends N. from Vicksburg to the borders of Tennessee. The greater part of the delta is now protected from the floods by levees, and that portion of it which has been taken into cultivation has proved exceedingly productive. The state contains much good pasture land, especially in the N.E. district. The products are exclusively agricultural, the chief being cotton, corn, and oats. In the south fruit and vegetables are grown largely for foreign consumption; and another important export is timber, which is prepared in the saw-mills on the Pascagoula and the Pearl. This state, originally part of the French colony of Louisiana, belonged to Great Britain since 1763; it was admitted into the Union in 1817.

Missolonghi, a Greek seaport of modern origin, situated on a swampy plain in the nomarchy of Ætolia, 24 miles W. of Lepanto. It was twice besieged by the Turks in the course of the War of Independence. During that struggle Lord Byron (q.v.) died here of fever (1824).

Missouri ("Great Muddy"). The real head stream of the Mississippi; it is formed by the junction of the Jefferson, Madison, and Gallatin, which flow N. from the Wind River Mountains, on the borders of Wyoming and Idaho, and unite at Gallatin city, Montana, in lat. 45° 54' N., long. 111° 30' W. Its course thence is N. as far as Fort Benton (about 200 miles), whence it trends towards the E. About 90 miles beyond Gallatin city it passes through the "Gate of the Mountains," a magnificent gorge nearly six miles long, with precipitous cliffs of granite (1,200 feet in height) on either side. At the Great Falls, 60 miles below the Gate, the river descends 327 feet in 15 miles, the highest single fall being 87 feet. From Fort Benton it flows E. through Montana and part of Dakota, then S. and S.E. through Dakota and between Iowa and Missouri on the left, and Nebraska and Kansas on the right, as far as Kansas city, where it turns E., joining the Mississippi 20 miles above St. Louis. Its chief tributaries are the Yellowstone, Platte or Nebraska, and Kansas, all on the right bank. The river can be ascended to Fort Benton, or, in the dry season, to the Yellowstone; but navigation is dangerous, and has to be almost completely abandoned in favour of railway communication. The waters of the Missouri are turbid, and it has a swift current. The total length is 3,047 miles.

Missouri is the name of one of the United States, having Iowa on the N., Nebraska, Kansas, and Indian Territory on the W., Illinois, Kentucky, and Tennessee on the E., Arkansas on the S.; area 69,415 square miles. The Mississippi forms the eastern boundary. The state is divided into two unequal portions by the river Missouri, that on the south side being much the larger. North Missouri is for the most part level or gently undulating, but to the south of the river the surface is more varied, the Ozark Mountains (1,500 feet) forming a break in the vast expanse of rolling prairies. In the S.E.

there is a tract of marshy and very fertile land, formed by the subsidence of the soil in the earthquakes of 1811-12. The most important crop is maize; but oats, wheat, potatoes, hemp, sorghum, and tobacco are also grown in large quantities. The raising of live stock for foreign consumption is now a growing industry. Missouri is rich in coal, iron, zinc, copper, lead, nickel, and other mineral products. In the north and centre there is a very extensive coalfield extending into Kansas and Iowa. Iron ore is found chiefly S. of the Missouri, especially in the S.E. Jefferson city is the state capital; but by far the most important town is St. Louis, a centre of great commercial and manufacturing activity. Missouri was constituted a territory in 1812, and admitted to the Union in 1821.

Mistletoe (*Viscum album*), an interesting parasitic plant, belonging to the order Lorantheæ, the only species of its genus which is a native of Europe. It forms an evergreen bush, sometimes four feet long, with a woody stem, repeatedly and dichasially branched, and having no cork but a persistent epidermis. The yellowish-green leaves are sessile, leathery, in opposite pairs, and obovate in form. The small flowers are diœcious, and appear in February or March. They have four perianth-lobes, the anthers in the male flowers being epiphyllous and opening by numerous pores. The fruit is a pearly transparent berry, full of viscid pulp, and containing one adherent seed, destitute of a testa. The seed often contains two embryos. The berry is eaten by many birds, especially the missel-thrush, and from their beaks the seeds are rubbed into cracks in the bark of trees. The roots of mistletoe graft themselves into the sap-wood of many trees, especially the apple, poplar, lime, and hawthorn, rarely on the oak, but occasionally on cedars and firs. Less than twenty mistletoe-oaks are known in England, nearly all of them in Herefordshire. Jack-in-the-Green's May-day garb of boughs is said to be a relic of that worn by Druids when searching for a mistletoe oak, round which, when found, they are said to have danced singing "Hey derry down," or "In a circle move we round the oak." Pliny describes how the white-vested arch-druid cut the plant with a golden sickle and distributed it as an all-healing remedy. Its downward growth long led to its use as a cure for giddiness. The origin of its modern use is somewhat obscure. Many tons are annually brought to London from Herefordshire, Worcestershire, Gloucestershire, and Normandy.

Mistral, in southern France and the adjacent districts, especially in the Rhone valley, a strong, cold, and dry wind from the north-west.

Mistral, FRÉDÉRIC (b. 1830), a French poet, whose success as a writer in the ancient and beautiful *langue d'oc*, the resources of which had already been shown by Jasmin (q.v.), has been followed by the rise of quite a large group of Provençal bards. The Provençal language, now a mere dialect, was Mistral's native tongue, for he was born (the son of a peasant), near Maillaune, in the department of Bouches-du-Rhone. His epic poem *Mirèio* (1859) has been ably translated by

Miss Harriet Preston. He also wrote *Calendon* (another epic), *Lis Iselo d'Or* (a volume of poems), *Nerto* (a novel), and a Provençal dictionary.

Mitchel, JOHN (1815-75), Irish revolutionary leader, was the son of a Presbyterian minister at Dungiven, in county Londonderry. He was educated at Trinity College, Dublin, and became a solicitor. From 1845 to 1847 he edited the *Nation*, but resigned his post to start the *United Irishman*, in which he advocated a policy of physical force. He was in consequence convicted of treason-felony, and transported to Van Diemen's Land (1848), whence he escaped to the United States (1853). In 1874 he returned to Ireland, but a petition was lodged against the return, and Mitchel died before the matter was decided. He published a *Life of Aodh O'Neil* (1845), and other works.

Mitchell, SIR ANDREW, was born in 1757, and after having served under Commodore Sir Edward Vernon in 1778, was made a post-captain. He attained flag-rank in 1795, and became a vice-admiral in 1799. In that year, as second to Lord Duncan, he commanded the expedition to Holland, and took possession of the Dutch fleet in the Texel. For this service he received the thanks of the House of Commons and a K.B. He afterwards held a command in the Channel fleet, off the coast of Ireland, and at Halifax. He was made an admiral in 1805, and in the following year died at Bermuda.

Mitford, MARY RUSSELL (1786-1855), the authoress of *Our Village*, a delightful series of sketches depicting English country life in the early years of the 19th century, was born at Alresford, in Hampshire, where her father practised as a physician. In consequence of his extravagance they were obliged to settle in a small cottage at Three Mile Cross, near Reading, and here she supported herself and her father by writing dramas for the London stage. The papers contained in *Our Village*, after appearing in the *London Magazine*, were published separately (1824-30). *Atherton*, a novel, appeared in 1854.

Mitford, WILLIAM (1744-1827), historian, was the son of a country gentleman in Hampshire. He entered Parliament in 1783. His ample means enabled him to spend 30 years in the composition of a *History of Greece* (1780-1818), which is now little read but by no means forgotten. It is marked by all the prejudices of a bigoted Tory partisan.

Mithradates Eupator, or THE GREAT (sometimes incorrectly spelt *Mithridates*), (circa 132-63 B.C.), succeeded his father about 120 B.C., and soon became master of the shores of the Euxine as far as the Tauric Chersonese. In 88 B.C. an invasion of the King of Bithynia, who had been incited by the Romans to attack Mithradates, gave rise to the first Mithradatic War. Mithradates rapidly gained possession of the neighbouring kingdoms, and overran the Roman province of Asia; but he was expelled from Pergamus by C. Flavius Fimbria in 85, and in 84 Sulla forced him to restore his conquests and pay a large indemnity. In the course of the second Mithradatic War (83-81) Mithradates

greatly strengthened his position in Asia. He brought about the third Mithradatic War by his invasion of Bithynia (74), in which he was aided by certain Romans favourable to the cause of Marius. After some successes he was forced by Lucullus to seek refuge with Tigranes of Armenia (72), and in 68 the same general defeated both kings in the battle of Artaxata. The war was brought to a close by Pompey, who defeated him on the Euphrates near the Armenian border. Mithradates now withdrew to the Cimmerian Bosphorus. Three years afterwards he killed himself at Panticapæum (Kertch), to escape falling into the hands of his rebellious son, Pharnaces.

Mithras, the sun-god of the Zoroastrian system, eventually identified with the Supreme Being. He was supposed to intervene between Ahriman (q.v.) and Ormuzd.

Mitrailleuse, a breech-loading machine-gun, consisting of a number of small barrels bound together and so arranged as to be capable of continuous fire for short periods. The original mitrailleuse was the invention of a Frenchman named Montigny, and was expected to play a very important part in the Franco-German War of 1870. It failed, however, to produce much effect. More perfect weapons of a similar kind have been invented by Gardner, Hotchkiss, Nordenfelt, Gatling, and others.

Mitre, a sacerdotal head-dress conferred by the Pope as a distinction on cardinals and certain prelates and abbots. The present form is a lofty cleft cap, rising from a coronet. It is now regarded as an attribute and symbol of bishopric, and is occasionally worn by a few Anglican bishops. There are three kinds of mitres, the mitre of precious metal, the auriphrygiate, and the cap of silk or fine linen. The head-dress of the Jewish high priest is called a mitre. The origin of this cap of dignity seems to be Oriental, and was perhaps derived from an article of female attire.

Mitscherlich, EILHARD (1794-1863), German chemist, was born near Jever, in Oldenburg. Whilst a student at Heidelberg (1811-13) his attention was devoted chiefly to Oriental languages, and he conceived an ardent desire to visit Persia. To promote this end he resolved to study medicine, and whilst thus engaged became so interested in the science of chemistry that he abandoned his original intention. The theory of isomorphism was worked out by him in 1819. He became extraordinary professor of chemistry at Berlin in 1822, and ordinary professor in 1825. His chief book was *Lehrbuch der Chemie* (1829-35).

Mivart, ST. GEORGE, F.R.S. (b. 1827), man of science, was educated at Harrow, King's College, London, and the Roman Catholic College of St. Mary, Oscott. He was elected vice-president of the Zoological Society in 1869 and 1882, and of the Linnæan Society in 1880. His works include *The Genesis of Species* (1871), combating Darwin's theory of "natural selection," *The Cat* (1881), an introduction to the study of backboneed animals, and *On*

Truth (1889), in which he demonstrates the foundations of scientific knowledge. He died in 1900, having left the Roman Catholic Church shortly before his death.

Mixtecs, one of the civilised peoples of Mexico, whose territory (Mixtecapan) occupied the present states of Oajaca, Puebla, and Guerrero—that is, a large part of Central and South Mexico. It comprised a great number of petty states, all of which recognised the suzerainty of a lord paramount, who was one of the most potent allies of the Aztecs. The present Mixtecs, although Roman Catholics, still speak the old national language, which is radically distinct from Aztec, and of which there are several well-marked dialects.

Moabites, an ancient Arabian tribe which inhabited the highlands E. of the Dead Sea, and S. of the river Arnon, or Wady Mojib. They were said to be descended from Lot. They reduced the Israelites to subjection for eighteen years during the period of the Judges, were made tributary by David, and disappeared as a separate tribe after the Babylonish captivity.

Mobile, the most populous town of Alabama, U.S.A., is situated on the Mobile river, at the head of Mobile Bay, an inlet of the Gulf of Mexico. The harbour admits vessels drawing 13 ft., and there are a floating dry-dock and several shipyards. The cotton trade has declined since the Civil War, but the export of timber is of growing importance. Many of the inhabitants are of Spanish descent.

Mobilier, CRÉDIT, a large banking and financing company formed in Paris in 1852, which has been repeatedly reorganised and has considerably reduced its capital in the process. Its object was to lend money on the security of property other than real property [CRÉDIT FONCIER], and to "finance," or take shares in, industrial companies, railways, etc.

Mocking Bird (*Mimus polyglottus*), an American thrush-like bird ranging from 40° N. to Mexico. The length is about ten inches, the plumage, brown above, white on the under-surface. It is much valued as a cage-bird, owing to its vocal powers, which, in imitative notes and natural song, are said to exceed those of any other species.

Mocobi, a warlike South American nation, who still maintain their independence in the Argentine provinces of Gran Chaco and Santa Fé; they are hereditary foes of the Tobas, although both of these powerful nations have a common origin and speak dialects of a common stock language. By Brinton (*American Race*) they are regarded as members of the Guaycuru family.

Modena (anc. *Mutina*), a town of north Italy, capital of the former duchy of the same name, 23 miles N.W. of Bologna by rail. It is situated on a broad plain between the Panaro and Secchia, which are here joined by a canal. The cathedral, a Romanesque building, with a handsome façade and a lofty campanile, was begun in 1099. The ducal palace—a noble pile erected in the 17th century, with splendid courts surrounded by colonnades—contains a library

of 90,000 volumes and 3,000 MSS., a gallery of paintings, and many interesting monuments of antiquity. The university was founded in 1678. Leather and silk goods are manufactured. The origin of Modena dates back to the days of the ancient Etruscans, from whom it was conquered by the Gauls, before passing into the hands of the Romans. It was made the capital of a county by Charlemagne, and was ruled by the family of Este from the 13th century to their final expulsion in 1860. Since that date it has formed part of the kingdom of Italy.

Modjeska, HELENA, Polish actress, born at Cracow in 1844, adopted acting as a profession in 1862. In 1876 she emigrated to America with her second husband, Count Chlapowski, and in the following year appeared at San Francisco as *Adrienne Lecouvreur*, the rôle which had made her reputation at Warsaw nine years earlier. Her acting excited the greatest enthusiasm in America, and she was also well received at several London theatres. Mme. Modjeska died in 1909.

Modulation, in music, the science of the correct and appropriate sequence of tones and harmonies in a melody. The composer is instructed by this study to choose tones (except such as are only used in passing) which belong to the key he is assuming, and how to proceed from one key to another, finally returning to the fundamental key.

Modulus of a material is a measure of its elasticity (q.v.) when its length, volume, or shape is altered, the respective moduli being those of length, bulk, or rigidity. The modulus is the ratio of the stress to which the material is subjected, to the strain, or proportionate deformation produced. If 10,000 lbs. per square inch will extend a bar 7 inches long to the extent of $\frac{1}{100}$ th of an inch, the stress is 10,000, the strain $\frac{1}{100}$, and the modulus of elasticity of length $10,000 \div \frac{1}{100} = 7,000,000$ lbs. per square inch. [LOGARITHMS.]

Moesia, in classical geography, was a region to the south of the Danube, corresponding pretty closely to the modern Servia and Bulgaria. The original inhabitants, probably Thracians, were subdued by a body of Celtic invaders in B.C. 277. The Roman province, formed in the reign of Augustus, was subsequently divided into two—Moesia Superior (Servia), and Moesia Inferior (Bulgaria)—probably soon after the accession of Trajan. The Goths first appeared in Moesia in 250 A.D.; the Visigothic settlement took place under Valens in 376. The irruption of the Slavonians and Bulgarians began in the 5th century and continued till the 7th century.

Moffat, ROBERT (1795–1883), missionary, was born at Ormiston in East Lothian. In 1816 he was sent to South Africa by the London Missionary Society, and travelled northwards to Afrikaner's kraal; he afterwards removed to Griqualand. In 1819 he married Miss Mary Smith, who greatly assisted his efforts. After various wanderings through the neighbouring regions he settled at Kuruman in Bechuanaland (1826), which henceforward became his head station. Here, with the exception of a visit to England in 1838–43, he

remained till 1870, preaching the Gospel and translating the Bible into the Sechwana language. His daughter married David Livingstone.

Mogador, or SUERRAH, a seaport on the Atlantic, 130 miles W.S.W. of Morocco. It is situated on a promontory which consists of sand-hills towards the land, but becomes rocky as it juts into the sea. The harbour lies between the promontory and an island. It was built in accordance with the plans of Cornut, a French engineer (1760). Nearly half the inhabitants are Jews. Exports include almonds, olive-oil, ostrich-feathers, gums, goat-skins, and esparto grass.

Moghul (properly MUGHAL), the Arabic, Persian, and Indian form of *Mongol*, applied especially to the chief Mongolian tribe in the Chagatai steppe, thence known as *Moghulistan*. Later the term passed into India with Sultan Baber, who, as a descendant of Jenghis Khan, was a reputed Mongol, and founder of the Moghul Empire; but his descendants, the "Great Moghuls," had very little Mongol blood in their veins, while most of his followers were rather of Turki (Tartar) than Mongol descent. Of the Chagatai Moghuls the chief divisions were the Doghlats, Khiras, Konchi, Begchaks, and Tekrits, now best represented by the Uzbeqs of Bokhara. [CHAGATAI.]

Mohair, the woolly hair of the Angora goat of Asiatic Turkey. Though known since 1655, this product was little used in Western Europe until 1820. The goat has been successfully acclimatised in the dry plateaus of Oregon, California, Cape Colony, and Australia. We import upwards of 20,000,000 pounds of mohair annually, nine-tenths of this amount through Constantinople, and most of the remainder from Cape Colony. The fibre may be four or five inches long, white, lustrous, elastic, and durable, and is used in making plush, Utrecht velvet, imitation fur and ostrich feathers, braids, and boot-laces.

Mohammed, or MAHOMET (Arab. *Muhammad*, "the praised one"), the founder of Islam, was born at Mecca about 570 A.D. Both his parents belonged to the Koreish, a tribe which claimed direct descent from Ishmael, and had charge of the Kaaba (q.v.) and other sacred spots. After the death of his father (which perhaps preceded his birth), his mother, and his grandfather, he passed in his ninth year under the tutelage of his uncle, Abu Tâlib. At the age of twenty-four he left Abu Tâlib's house to enter the service of the wealthy widow Khadija. He was sent in charge of her goods on a mercantile journey to Syria, where he renewed his acquaintance with the Jewish and Christian religions, of which he had already gained some knowledge during a similar expedition with his uncle thirteen years before. Soon after his return he became the husband of Khadija, who was now about forty years of age, and with her he lived a happy domestic life during the next fifteen years. As he was meditating one day in a cavern on Mount Hira, an angel appeared to him in a vision, and spake mysterious words concerning the Beneficent Lord who had created man. After a while

the angel visited him again, bidding him "arise and preach," and from this time he felt assured of his divine mission. The faithful Khadija was the first to believe in him; his next converts were his adopted children Ali and Zaid, and his friend Abu Bekr; others speedily followed, and soon he had gathered round him a band of fifty disciples, composed of his kinsmen and his closest friends. Most of the Koreish, indeed, viewed his proceedings with scorn; but it was not till the fourth year of his mission, marked by the opening of a sort of school opposite the Kaaba and a great increase in the number of his followers, that the people of Mecca became seriously alarmed. In the sixth year of his mission the accession of the fierce Omar greatly strengthened his cause, and the increasing boldness of himself and his followers led to the formation of a confederacy among the Koreish, by which he and his family were for a time placed under a ban. Four years later Khadija and Abu Tâlib died, and Mohammed, convinced that the cause would never prosper at Mecca, determined to seek a home for the true believers elsewhere. The rapid conversion of a number of pilgrims from Medina pointed to that city as the fitting spot, and thither the Moslems gradually removed in small bands, followed at last by Mohammed himself, probably on April 19, 622. [HEGIRA.] The emigration led to a great change in the character both of Mohammed himself and the religion which he taught. Hitherto known only as the leader of a despised sect, he suddenly became ruler over a city and two powerful tribes. As a result of this access of worldly power the functions of the prophet were now, to some extent, merged in those of the warrior, legislator, and judge. The inspired utterances in which he declared the will of God [KORAN] became less imaginative and emotional, but gained in precision and practical force. He had begun to regard his mission in a new light; he was to be not merely a moral reformer, but the founder of a new religion and polity, which should be spread by fire and sword throughout the world. For several years his arms were directed only against the Meccans and the Jews who abounded at Medina and in various districts of Arabia. A great victory over the Koreish was gained at Badr in 2 A.H., and, although he was defeated a year later, his expeditions against the Jews were so successful that in 7 A.H. the Meccans thought it prudent to conclude a truce with him for ten years. In consequence of this arrangement he was able to perform the pilgrimage to Mecca in 8 A.H. Shortly afterwards a violation of the terms of the truce gave him a pretext for attacking the town. Its surrender (630 A.D.) was followed by the gradual submission of the Arabs in every part of the peninsula, who acknowledged both his spiritual and temporal authority. He died whilst he was making preparations for an attack on the Syrian possessions of the Byzantine Empire, and was succeeded by Abu Bekr, his first convert outside his own family. The notion that Mohammed was a vulgar impostor has long since given way to more rational views, and it is now generally conceded that, making allowance for the circumstances of his country and age, he

must be regarded as one of the most earnest reformers and civilizing teachers who have appeared among mankind.

Mohave (MOJAVE, but properly AMAKWAKWA), North American Indians, an important branch of the Yuman family, who had formerly numerous settlements in Upper California, and especially about Fort Mohave on the Colorado river 400 miles above its mouth. They reached northwards beyond Hardyville, where they were conterminous with the kindred Chemehuevi. At present they are reduced to about 1,500, of whom 500 are in the Colorado River Agency, Arizona, 800 under the Fort Mohave superintendent, and 175 under no agency.

Mohawks, North American Indians, one of the six nations of the Iroquois confederacy, whose original seat was in the valley of the Mohawk River, state of New York. The Mohawks took a leading part in the affairs of the confederacy, and were renowned for their eloquence in the public assemblies, and for their valour on the battle-field. After the War of Independence nearly all the Mohawks passed into Canada, where they still number 2,350, of whom 1,300 are settled on Grand River, and 1,050 at Quinte Bay, Ontario. A mere handful remain in New York, grouped with other tribes in the Tonawanda and Onondaga reserves.

Mohicans (MOHEGANS), North American Indians, members of the Algonquian family, who, jointly with the Massachusetts and Narragansetts, occupied the region between the Hudson River and the Atlantic, being conterminous northwards with the kindred Etchemin and Abenaki tribes; they are immortalised by Fenimore Cooper in *The Last of the Mohicans*. Although supposed to be long extinct, there are a few calling themselves Mohicans in several counties of Connecticut, especially in New London and Norwich.

Mohilev, or MOGHILEV, a government of West Russia, with an area of 18,551 square miles. The surface is flat. Much timber is exported hence through the Black Sea ports. MOHILEV, the capital, is situated on the Dnieper, 95 miles S.W. of Smolensk. It is a bishopric, both of the Greek and Roman Catholic Churches. Tanning is carried on, and there is a large general trade. The Russians were defeated here by Davout in 1812.

Mohl, JULIUS (1800-76), Orientalist, was born at Stuttgart and studied theology at Tübingen. His love of Oriental learning drew him to Paris (1823), where he studied Arabic and Persian under De Sacy, and Chinese under Abel Rémusat. He became professor of Oriental languages at Tübingen in 1826, but passed most of his time in Paris. In 1847 he was appointed professor of Persian at the Collège de France. His chief work was his monumental edition of the *Shah Nameh* of the Persian poet Firdausi. His annual reports to the Société Asiatique, which afford a valuable survey of contemporary research, were collected and edited by Mme. Mohl (*née* Clarke), herself a literary lady of the highest eminence, whose *salon* was a centre of thought and refinement.

Möhler, JOHANN ADAM (1796-1838), an able Roman Catholic polemical theologian, was born at Igersheim, in Würtemberg. He studied theology at the university of Tübingen, and became professor there in 1828. His chief work, *Symbolism: or, the Doctrinal Differences between Catholics and Protestants* (1832), gave rise to much controversy.

Mohmands, a large division of the Afghan nation, who occupy the hills N.W. of Peshawar between the Kabul and Swat rivers. There are seven main groups—Tarakzai, Halmizai, Baizai, Kwaizai, Utmânzai, Dawezai, and Kukazai, with 63 Khels. In 1908 the Mohmands rose against British authority, and the Holy War was preached.

Moire, a kind of watered silk, so named after watered mohair (q.v.). Moire antique is silk watered so as to resemble antique fabrics.

Mokanna, HAKIM BEN ALLAH ("the Veiled prophet of Khorassan"), so called from the veil which he had flung over his features

"To hide from human sight

His dazzling brow, till man could bear its light."

Mokanna claimed to be an incarnation of the Divine Being, and became the leader of a numerous sect, but was finally defeated by the Kalif Almahdi, and took poison to escape a worse fate (780 A.D.).

Molasses, the coloured, saccharine mother liquor which remains uncrystallised during the crystallisation of sugar. [SUGAR.]

Moldau, a river of Bohemia, 278 miles in length. Its source is in the Böhmerwald Mountains in lat. 49° N., at an elevation of 3,870 feet above the sea. It flows S.E. for 50 miles, and then curves N., joining the Elbe at Melnik.

Mole, a breakwater of rubble or masonry stretching across a port or harbour.

Mole, any individual of the insectivorous genus *Talpa*, type of the family Talpidæ (with eight genera, containing nineteen species), from the Nearctic and Palearctic regions. The type-genus (with eight species) has the range of the family. The best known of these, the Common Mole (*T. europæa*), is found all over Britain, but is absent from Ireland and the western islands of Scotland. In Europe it is widely distributed, and ranges eastward nearly as far as China. This little burrower is about six inches long, of which the scaly tail counts for one inch; the body is elongated and cylindrical; the wedge-shaped head terminates in a sharp snout, well-fitted to bore into the earth; the fore limbs are short and muscular, and the palms directed outwards form shovel-shaped organs admirably adapted for digging. The breadth of the palm is increased by a sickle-shaped bone projecting inwards from the wrist, and considered by some authorities to represent a lost first digit or prepollex. The hind feet are long and slender, and, like the hands, of a pale flesh colour. There is no external ear, the eyes are minute, and in the other species they are covered by a membrane. The fur is thick and velvety, generally black in colour, sometimes with a greyish

or brownish tinge; but a paler coloration is sometimes met with, and albino forms are recorded. The mole is a flesh-eater, and its favourite food consists of earthworms and insect larvæ. In confinement no kind of flesh comes amiss to it, and when pressed by hunger it has been known to attack lizards and frogs, and even to devour a weaker companion that shared its prison. It is



COMMON MOLE. (*Talpa europæa*.)

extremely voracious, and requires a constant supply of food; indeed, a fast of twelve hours is said to be fatal to it. For the greater part of the year moles are solitary. Pairing takes place in the spring, and the female brings forth her young, generally four or five, in a separate chamber, usually at some distance from the "fortress," as it is the fashion to call the mole's dwelling. This admittedly consists of a central chamber, from which lead passages or runs, along which the animal goes on his hunting expeditions. But it may be doubted whether the symmetrical galleries described by Le Court, whose figures have been copied into most books on natural history, are of frequent occurrence. Mole-hills appear to be thrown up by the animal when hunting, or in pursuit of a mate. Moles are credited with doing a great amount of damage to lawns and fields, and are trapped in large numbers; but against the damage they do should be set the benefit to the farmer by the destruction of immense numbers of insect larvæ. The "blind" mole of Aristotle is *T. cæca*, from the south of Europe. America has two genera—*Scalops* (the Shrew-Moles), and *Condylura* (the Star-nosed Mole), with a ring of movable filaments, probably organs of touch, at the end of the snout.

Molé, MATTHIEU LOUIS, COMTE (1781-1855), a French statesman, whose ancestors had taken an important part in the disturbances of the Fronde, and whose father was President of Parliament in 1788. The son came to Paris after the Revolution, and made his *début* by an *Essai de Morale et de Politique*. Having defended Napoleon's Government, he was made Master of Requests, and in 1813 count and cabinet minister. Louis XVIII. made him peer of France and Minister of Marine in 1815, and under Louis Philippe he was for a

time at the head of Foreign Affairs. In 1836 he became Prime Minister. In 1836 he failed to get elected to the Assembly, and retired into private life, to come once more to the front through election to the Assembly after the Revolution of 1848.

Mole-Cricket (*Gryllotalpa vulgaris*, Linn.), is the largest and most voracious of British crickets. It lives in burrows made by the front legs, which are flattened out like those of the mole. Its voracity is extraordinary, and cases are recorded of the front half of one which has been cut in half attempting to eat the other half.

Molecule. A molecule may be defined as the smallest subdivision of any kind of matter which is capable of existing in the free state. This definition necessarily assumes that matter is not infinitely divisible, an assumption arrived at both from chemical and physical grounds. Each molecule is again built up of *atoms* (q.v.), the number, nature, and mode of union of the atoms varying with the various forms of matter known to us. In elementary substances all the atoms are of the same kind, and in most the molecule, in the gaseous state, consists of two atoms. The molecule of some elements, however, appears to consist of only one atom, *e.g.* mercury, zinc, etc., while in other cases, *e.g.* phosphorus, it is polyatomic. Our knowledge of the complexity of liquid and solid molecules is, however, extremely limited. The absolute size and weight of the molecules have formed the subject of a considerable amount of physical research. From the results, the diameter of a molecule is estimated at from 10^{-8} to 10^{-7} of a millimetre. A better idea may be derived by stating it bears the same ratio to an ordinary marble as a marble does to the earth. The determination of the relative weights of the molecules of substances when referred to that of hydrogen is an important quantity in chemical calculations and has to be calculated with great care. As, according to Avogadro's law, equal volumes of gases under similar conditions of temperature and pressure contain the same number of molecules, the determination of the vapour density of a substance forms the best method of finding the molecular weights. Frequently, however, the substance cannot be vaporised, and then other methods are employed. Chief among these is a method due to Raoult, which is dependent on the fact that when a weight of any substance is dissolved in a liquid which does not act upon it chemically, it lowers the freezing-point of the liquid to an extent dependent upon its molecular weight; a similar lowering of the vapour pressure of the liquid or production of an *osmotic pressure* (q.v.) may also be employed.

Mole-Rat, any individual of the family Spalacidae, burrowing rodents of mole-like form and habit, but feeding principally on roots. They occur in south-eastern Europe, are widely distributed over Africa, and less widely in Asia.

Molesworth, MRS. (MARY LOUISA STEWART), was born at Rotterdam, and passed the early part of her life successively at Manchester, in Scotland, and in Switzerland. She was educated partly by her mother, and partly by Mr. Gaskell, husband of

the novelist of that name. She embarked in literature at an early age, among her earlier works being *Lover and Husband*, *She was Young and He was Old*, *Cicely*, *Hathercourt Rectory*, and *Miss Bouverie*. She has also written much in magazines for the young, one of the most noted of her tales for children being *Carrots*.

Molesworth, SIR WILLIAM (1810–1855), 8TH BARONET, was born in London, and inherited estates in Cornwall and Devon in 1823. In 1832 he entered Parliament for East Cornwall, and supported the policy of Earl Grey, sitting later for Leeds from 1827 to 1841. In 1835 he had joined with Mr. Roebuck to start *The London Review*, which represented the views of those who were called "Philosophical Radicals." During a temporary retirement from public life, from 1841 to 1845, he edited the works of Hobbes. From 1845 to 1855 he represented Southwark in Parliament, and gave much attention to the question of our Colonies, which he made his special subject. In 1852 he became Commissioner of Public Works in Lord Aberdeen's Government, among the works carried out under his *régime* being the building of Westminster Bridge. In 1855 he was made Colonial Secretary, but did not live to carry out his views.

Molière, the father of French comedy (1622–73), was really named JEAN BAPTISTE POQUELIN. He was born at Paris, where his father was upholsterer to the king. After the death of his mother in 1632, and the remarriage of his father the following year, Molière went to the Collège de Clermont, which he left in 1641. He had a taste for philosophy, and at college he became imbued with the ideas of the Aristotelian system; but after coming to Paris he turned his attention to Lucretius and translated the *De Natura Rerum*. He then appears to have studied law; but in 1642 we find him acting as "valet tapissier" to Louis XIII., and in the next year he became a comedian, and made the acquaintance of the family Béjard, who had a great influence on his life, for one daughter, Madeleine, became his mistress or firm friend, and in 1642 he married another daughter of the family, Armande, whom, however, his enemies and calumniators (who were many) represented as being the daughter of his mistress Madeleine. He played for some years in different parts of France, and in 1653 produced at Lyons his first comedy, *L'Étourdi*. In 1656 his second comedy, *Depit Amoureux*, was produced at Beziers. Conti had patronised him, but, turning religious, threw over the actor, and even wrote against him at a later period. However, Molière had already made his mark, and in 1658 was commanded to play before Louis XIV. The next year appeared his *Précieuses Ridicules*, afterwards expanded into *Femmes Savantes*. In 1660 appeared *Sganarelle*, and many other plays followed in rapid succession, among the best known of these being *Le Tartuffe*, *Le Misanthrope*, *Festin de Pierre*, *Le Médecin malgré Lui*, *Georges Dandin*, *Le Bourgeois Gentilhomme*, *L'Avare*, *Le Malade Imaginaire*. He was a good actor, and played right up to the time of his death. Molière is one of the few earlier French writers who has found as great favour in

the eyes of foreigners as in those of his own countrymen. Molière is said to have read his plays to his housekeeper with a view to discovering how an audience would take them. His clerical enemies pursued him beyond the grave by denying his body Christian burial, but the king's insistence obtained for him this privilege.

Molina, LUIS (1535–1600), a Spanish Jesuit, who was born at Cuenca. He entered the order at 13, and studied theology at Coimbra, and then became a professor at Evora, and later taught moral theology at Madrid. His great work in life was the treatment of the question of free-will and predestination, and his endeavour to harmonise the theory of free-will with that of grace made a great commotion. The Dominicans vigorously attacked his position, and finally reference was made to the Pope, who cut the knot by imposing silence upon the combatants. Molinism passed finally into Jansenism, and is noticed by Pascal in his *Lettres d'un Provincial*. Molina also wrote a commentary upon part of the *Summa* of St. Thomas Aquinas.

Molinos, MIGUEL (1627–96), a Spanish theologian, was born at Saragossa, and educated at Pampeluna and Coimbra. Having taken orders, he went to Rome, where he achieved a great reputation as a director. In 1675 he wrote his *Spiritual Guide*, which displayed features of mysticism, verging towards what was called "Quietism." Now that his reputation was universally established he was attacked by the preacher Segneri on the ground that his system annihilated the will. The Jesuits joined in the attack, and in spite of the favour of Cardinal Odeschalchi (afterwards Pope Innocent XI.), the Jesuits opposed him, and in 1605 he was cited before the Inquisition, and called on to abjure his errors, and was committed to prison for life. One of the chief points objected to in his doctrines was the theory that "internal perfection" was compatible with external excesses.

Mollusca, one of the great groups or *phyla* of the animal kingdom. Molluscs live either on land or in fresh or salt water, and are very widely distributed. The following is the classification most widely accepted at present:—

Subphylum Lipocephala	Class Lamellibranchiata
" Glossophora	" Gastropoda
	" Scaphopoda
	" Pteropoda
	" Cephalopoda

Moloch, MOLECH, an iron idol of the Ammonites on which children were burnt alive as sacrifices. It represented the chief god of the Phœnician mythology; also called *Milcom*.

Moloch Lizard, or THORN DEVIL (*Moloch horridus*), a small Australian agamid lizard, of grotesque appearance. The body is thickly set with spines in longitudinal rows, the tail and limbs are studded with them; and the head seems a miniature copy of that of the two-horned rhinoceros.

Moltke, HELMUTH KARL BERNHARD GRAF VON (1800–91), the most celebrated of modern generals, was the son of a captain in the Prussian army who afterwards became a general in the

Danish service. In 1833 he became lieutenant, and in 1835 captain. He afterwards went to Turkey, where he became military adviser of the Sultan Mahmud, and saw some service. Returning to Berlin after the death of Mahmud, he embodied his Eastern experiences in *The Russo-Turkish Campaign of 1828–29 in European Turkey*, and *Letters on Affairs in Turkey 1835–39*. In 1842 he married an English lady, who died in 1868, and some of his most interesting letters were written to her from Paris and elsewhere. In 1859 he became Lieutenant-General, and in 1864 his military genius was the chief cause of the defeat of Denmark, as it was of that of Austria in 1866. Moltke had long foreseen the war which broke out between France and Germany in 1870, and his was the animating spirit of the tactics throughout the war, though he had often great need of tact in causing his views to recommend themselves to the Emperor William. The fall of Metz brought Moltke honours. He was made Count and Field-marshal, and received a grant. The end of his life was passed in peaceful leisure, and the esteem in which his country held him was shown by the enthusiasm displayed upon the celebration of his 90th birthday. Moltke, though a small talker, was a great linguist. His *Essays, Speeches, and Memoirs* have been published in two volumes. (London, 1893.)

Moluccas (Dutch *Molukken*), or SPICE ISLANDS, are situate in the Malay archipelago, between Celebes and Papua, and extend from lat. 3° to 5° S. They consist of three groups—(1) Moluccas proper, containing the islands Fernate, Gilolo, Batshian, Obi, Morti, and many islets; (2) Amboyna (the seat of government), Ceram, Booroo, and several islets; (3) Banda islands. Nearly all the islands are mountainous, having peaks varying from 7,000 to 8,000 feet in height, mostly volcanic, and some of them active volcanoes; and the whole district is subject to earthquakes. There are in all several hundred islets, most of them small and uninhabited. The chief products and exports are cloves, nutmegs, sago, mace, edible birds'-nests, trepang, shark's fins, some gold, and birds of paradise. The islands have been held in turn by Spain, Portugal, and Holland, and were held by England from 1796 to 1801, and from 1810 to 1814. The language spoken along the coasts is Malayan.

Molybdenum (Mo; atom. wt. 95·9), is a rare silver-white metal which occurs in a few minerals, chief of which are *molybdenite*, the sulphide MoS₂; *wulfenite*, lead molybdate PbMoO₄; and *molybdic ochre*, an oxide MoO₃. The metal is hard and fuses with difficulty. It has a specific gravity of 8·6, and dissolves in concentrated acids. It forms many oxides and their corresponding chlorides, the formation of two chlorides of formulæ MoCl₄ and MoCl₅ being interesting. The higher oxides possess acidic properties, and in its general chemical behaviour, as would be expected from its atomic weight, it shows many resemblances to chromium.

Mombasa, an island and town off the coast of Zanzibar, east Africa, in lat. 4° 4' S. It is the headquarters of the Imperial British East Africa

Company. The island is three miles long by two wide, and the channel separating it from the mainland affords good harbours. The town is on the North Harbour, and a railway 584 miles in length has been constructed from Mombasa to Lake Victoria Nyanza. For a long time the island belonged to Portugal, but from 1823-26 it was under British protection, the country, however, refusing to annex it. Later the Sultan of Muscat took it, and left it to his son, the Sultan of Zanzibar. In 1888 the Sultan gave government rights to the Imperial East Africa Company, and in 1902 the island, together with a large mainland district, came under the East Africa Protectorate.

Mombuttu (*Mangbattu*), a large Negroid nation of the Upper Welle basin, south-east Sudan, whose king, Munza, when first visited by Schweinfurth in 1876, ruled over an extensive territory, with a population of at least one million. But before the Mahdist revolt the empire had already been overthrown by the Arab slave-hunters; and at present the Mombuttus appear to have been brought within the influence of the Congo Free State. They are of much lighter complexion than most Negro peoples, and also distinguished by a Jewish type of nose, somewhat full beard, and a tendency to albinism, as shown by the large percentage (one-twentieth) of persons with flaxen woolly hair. The men wear bark-cloth garments, while the women are chiefly draped in black paint, applied in bands or spots to represent zebra or leopard skins. They are a highly intelligent people, skilled workers at most crafts, and fairly civilised, although perhaps the most pronounced polygamists and cannibals in the whole of Africa (Schweinfurth, *Heart of Africa*; Junker, *Travels*, vols. ii. iii.)

Moment, in mechanics. If a force be applied to a body which either has one point in it fixed, or is attached by means of a rod to some other fixed point, that force will be unable to cause the body to move in any way, except to rotate round the fixed point. The amount of rotation which the force is capable of producing depends on the magnitude of the force, and on the perpendicular distance between the point and the direction of the force. The product of the force and the length of the perpendicular measures the rotation which the force can produce, and is termed the *moment of the force about the point*. If a line be drawn through the point perpendicular to the plane which contains the force and the point, that line will form an axis of rotation, and the above product is then called the moment of the force about this axis. It is convenient to regard moments as positive or negative, according as the rotation is clockwise—i.e. in the direction in which the hands of a clock move—or contra-clockwise. The moment of a couple (q.v.) is the same for all points in space, and is equal to the product of one force and the perpendicular distance between the two. The *moment of inertia* of a body about an axis is the sum of the products obtained by multiplying the mass of each particle of the body by the square of its distance from the axis. This summation, as a rule, can only be done by the aid of the integral calculus.

Moment, MAGNETIC. The magnetic moment of a magnet is the product obtained by multiplying the strength of the pole of the magnet by its length, and is one of the factors in the moment of the couple which tends to turn a deflected magnet into the magnetic meridian.

Momentum, or, as it was called by Newton, the "quantity of motion" of a moving body, is the product of the mass of the body and its velocity. A force acting on a body for a certain time produces in that body a definite amount of momentum; and experiment has shown that the momentum is equal to the product of the force and the time during which it acts. When any body acts on a second, the latter reacts on the former, and the action and reaction are equal and opposite, as stated in Newton's third law of motion. The momentum produced by the action must therefore be equal to that produced by the reaction; this is equivalent to saying that there is no loss of momentum when two bodies act on each other. Applying this to any system of bodies mutually acting on each other, we see the momentum of the system remains constant. This fact is known as the conservation of momentum.

Momfu, a very large Negro nation, whose domain lies in the unexplored region between the rivers flowing north to the Welle and south to the Middle Congo either through the Aruwimi or in independent channels. The Momfu have not yet been visited by any explorers, and little is known of them beyond the meagre information obtained from neighbouring peoples by Dr. Junker during his wanderings in the Welle basin. (*Travels*, vol. iii.)

MommSEN, THEODOR (1817-1903), scholar and historian, was born in Schleswig, and studied at Kiel. He then went to France and Italy to make a special study of Roman inscriptions, being sent for that purpose by the Academy of Berlin. After his return he edited a newspaper for a time, and was in 1848 appointed to a chair of jurisprudence at Leipzig, a position which he lost by reason of his politics. From 1852-58 he professed Roman law successively at Zurich and Breslau, and in 1858 was appointed professor of ancient history at Berlin, and here he edited *Corpus Inscriptionum Latinarum* for the Berlin Academy. But the work by which he is best known in England is his *History of Rome*, published in three volumes (1854-56), with an additional volume in 1885 giving the history of the Roman provinces from Cæsar to Diocletian. This work, which has been translated into English, is a monument of scholarship and almost universal learning, though the political views taken in it have been called in question. Many other works he has published on Roman law, coins, inscriptions, history, etc. The esteem in which he was held by English students was shown upon the occasion of the burning of his library in 1880, when English students subscribed to make good in so far as possible his loss. His two brothers, TYCHO and AUGUST, have also made themselves names, the former as classical scholar, the latter in the region of Greek and Roman chronology.

Mon (MONG, MANGAR), a widespread people of Indo-China and north-east India, and found also in scattered groups in Yunnan, the Tonking highlands, and the Vindhya Mountains of Central India. All are rude, wild tribes except the Mons of Pegu, Lower Burma, whom the Burmese call Talaings, and who were civilised by the introduction of Buddhism in the 5th century of the new era. These were formerly the ruling people throughout the whole region watered by the Lower Irawady, Sitang, and Salwen rivers, but were reduced about the middle of the 18th century by the Burmese. Their language resembles that of the Mundas and other Kolarians of Central India, and all the Mon tribes are now regarded as originally of Kolarian stock. Most of the Mons of Lower Burma now speak Burmese, but their settlements may still be recognised in Pegu by the cocoanuts and red or yellow bannerets attached to the gables of the houses, in honour of the *Shway Yoe*, or "Protecting Spirit."

Monachism, the principle of leading a life of seclusion in religious houses in the manner of monks (*monachi*) and nuns. Properly the life is solitary, each member of the religious community occupying a separate cell and keeping silence at meals. Monachism, or the corporate life of collections of solitaries, was first instituted among Christians in the 4th century in Upper Egypt, but amongst Buddhists before the Christian era.

Monaco, a small European principality lying between the French Alpes-Maritimes and the Mediterranean, and formerly containing 53 square miles, but now much contracted, as in 1861 the reigning prince sold Mentone and Roccabruna to France for £160,000. So the principality now consists only of the towns of Monaco and Monte Carlo, with a surrounding district of eight square miles. Monaco, the capital, is on a peninsula, and is a celebrated watering-place, prettily situated amid olive, orange, and lemon groves. The exports are olive-oil, lemons, oranges, perfumes, liqueurs, and pottery. There is an army of 126 men. The Emperor Otho I. in the 10th century gave Monaco to the Grimaldi family, and a descendant of this family still reigns.

Monactinellidæ, the group of sponges including those forms in which the spicules (q.v.) consist of simple unbranched rods.

Monaghan, a county of Ulster, Ireland, having on the N. Tyrone, on the E. Armagh and Louth, on the W. Fermanagh, and on the S. Cavan and Meath. The extent is 319,741 acres, the greater part being arable, and it is 30 miles long by 20 broad. The surface is for the most part hilly, and is mountainous in the N.W., and there are many bogs and small lakes. The chief rivers are the Blackwater, Annalee, Finn, and Lagan, but these are not navigable. The chief crops are oats, potatoes, and much flax, but wheat is not grown. Spade-husbandry is a feature of the county. The linen manufactories employ many people. The county is divided in five baronies, and returns two members to Parliament. The principal towns are Monaghan (the capital), Castleblaney, Clones, Carrickmacross, and Ballybay. Pop. (1901), 74,611.

Monastery, an establishment in which monks live; the term is extended so as to include abbey, nunnery, priory, friary, and *laura*. In the Middle Ages monasteries fulfilled the functions of schools and colleges, hotels, workhouses and systems of poor relief, and missions. They were places of refuge, and in them the germs of dormant civilisation were preserved and developed. They used to be called *minsters* in England, as their churches are still called—e.g. York Minster.

Monastir, or BITOLIA, a town of Macedonia, in European Turkey, 400 miles W. of Constantinople, situate on the edge of a plain between two mountains and traversed by a river crossed by several bridges. The town is well built and has wide streets and handsome bazaars, while abundance of cypress and willow give it a pleasant appearance. It is an active military centre, and there are many Turkish soldiers and officials, the remaining majority of the inhabitants being Greeks and Bulgarians. There is a considerable trade with Constantinople, Salonica, Vienna, and Trieste.

Monboddo, LORD (JAMES BURNETT), (1714–99), a Scottish lawyer, was born at the family seat of Monboddo, in Kincardineshire. He was educated at Aberdeen and Gröningen, and, after practising at the bar, was raised to the bench of the Court of Session in 1767. He was much given to philosophical studies, but was eccentric and whimsical in views and manners. His principal works are *Origin and Progress of Language* (3 vols.), *Ancient Metaphysics* (3 vols.). He believed, or professed to believe, in satyrs, mermaids, and the like, and is noted for his theory of the close relationship that exists between man and the monkey.

Moneywort, a popular name applied to several plants, especially to *Lysimachia nummularia* and to *Anagallis tenella*, both indigenous members of the order Primulaceæ. The former, also known as Creeping Jenny and as Herb Twopence, is a trailing plant, with roundish glossy leaves and golden funnel-shaped flowers. The latter, generally known as the Bog Pimpernel, is much smaller, and has rounded leaves and small pink flowers. The name *Cornish Moneywort* is applied to *Sibthorpia Europæa*, also a trailing plant with rounded leaves, but belonging to the Scrophulariaceæ.

Monge, GASPARD (1746–1818), French mathematician and natural philosopher, was born at Beaune, and educated at Beaune and Lyons. He taught in the military school at Mezières, and, coming to Paris in 1780, lectured there upon hydrodynamics. In 1792 he became Minister of Marine and member of the executive, in which capacity he signed the warrant for Louis XVI.'s execution. Resigning his official position, he occupied himself with military improvements, and had a great share in founding the École Polytechnique. In 1795 he was sent to Italy to select art treasures for transport to Paris. In 1798 he accompanied Napoleon, with whom he was in favour, to Egypt; but, on Napoleon's downfall in 1815, he was expelled from the Institute and lost his appointments. Among

his many works are a *Treatise on Statics, Géométrie Descriptive, L'Art de fabriquer les Canons.*

Mongolo-Tatar, RACES AND LANGUAGES.
[URAL-ALTAIC.]

Mongols (MONGOLIANS), a main division of Mongolo-Tatar race [URAL-ALTAIC], who take their name either from the word *mong*, i.e. "brave," "daring," or else from the small *Mongol* tribe of which Jenghis-Khan was chief, and which in the 12th century was seated near the Kara-Kara mountains north of the Gobi Desert. The Mongols, taken as typical members of the family, are characterised by a distinctly yellowish complexion, somewhat of the same shade as the yellow of the Negro palm; long, lank, jet-black hair, cylindrical in section; beardless face; small, black, and oblique eyes; high cheek-bones; short, flat nose; moderately prognathous lower jaw; broad, flat features; short thick neck; squat, robust figures, rather below the mean height; generally of coarse build, and of ungainly appearance on foot, but more comely in the saddle, in which most of their existence is passed. Temperament sluggish, somewhat sullen or taciturn, passive, with little initiative and dull imagination, but with great staying power, and subject at times to sudden impulse and vehement outbursts; hence, although incapable of founding stable empires, they have more than once overrun the northern hemisphere from the China seas nearly to the Atlantic, and have imposed several dynasties on the Chinese; but since the 17th century they have been entirely subject to the Middle Kingdom, and during this period the whole nation appears to have been steadily declining. Observers speak of them as a dejected and even cowardly people, unmindful of the past, heedless of the future, almost indifferent to the present. At least, they show no capacity for social progress, persisting in their dirty, slovenly habits, clinging to their tents and herds (for all are still nomad pastors), and even passively allowing the Chinese peasants to overflow into their domain and gradually bring under cultivation all the best grazing grounds, and threatening them with absolute extinction in the near future. Unlike their Mohammedan Tatar kindred, the Mongols have been Buddhists since the 13th century, though preserving many traces of their primitive Shamanistic religion. The "Red Cap" sect was first introduced under Kublai-Khan; but it made little progress, and was completely supplanted in 1566 under Altin-Khan by the "Yellow Cap" sect, which, being more suited to the national character, spread rapidly, and is now the exclusive religion of all peoples of Mongol speech. The language, spoken with little dialectic variety by all branches of the nation, is a typical agglutinating form of speech intermediate between the eastern Manchu, and the western Turki; cultivated since the 13th century, when it was reduced to written form with a peculiar alphabet adopted from the Syro-Uighur by the Lama Sakia Pandita, and perfected by Tsorji Osir under Jenezek-Khan (1307-11). The letters are written in vertical lines and read from left to right; but the literature consists mainly of translations from Tibetan and

Chinese Buddhist writings with a few national chronicles, legends, and songs. The chief branches of the Mongols proper are the Khalkas, Sunni, Chakars, Urutes, Ordos, and Eleuths, in and about the east Gobi, the Kalmuks in the west, and the Buryats of the Lake Baikal region, Siberia. Those subject to China form 41 *aimaks* (principalities) and 226 *koshungs* ("banners"), under hereditary khans, numbering altogether from 3,000,000 to 4,000,000; but, including all branches, and the Persian-speaking Mongols of Afghanistan (Hazarahs and Aimaks), all the peoples of Mongol stock scattered over Asia and Europe (Lower Volga), are estimated at about 5,000,000. (Pallas, Klaproth; Schott; Ney Elias; Prejevalsky, *Mongolia*, 1876; H. H. Howorth, *History of the Mongols*, 1876-82.)

Mongoose. [ICHNEUMON.]

Monitor, an old synonym of Varanus, the type-genus of Varanidæ (Water-Lizards), chiefly from the Oriental region, and used also for any individual of the family. They are the largest living lizards; the tail is generally compressed laterally to serve as a swimming organ, and the protrusible tongue ends in two filaments. The Nile Monitor (*V. niloticus*), from five feet to six feet long, is olive-grey marked with black. The name is due to the belief that these reptiles give warning of the approach of a crocodile by a hiss or whistle. The young of the Indian species is erroneously supposed to be venomous. [HELODERM.]

Monk (properly MONCK), GEORGE, DUKE OF ALBEMARLE, was born in 1608, and, having first taken part in Lord Wimbledon's expedition to Cadiz in 1625, entered the army as a volunteer, and served with the expedition to the isle of Rhé in 1628. For some years afterwards he acted in a military capacity under the Earl of Oxford in Germany and Holland, and in 1639 fought in the war in Scotland. At the outbreak of the Rebellion he hesitated as to the side on which to range himself, but at last declared for the king. At the battle of Nantwich he was taken prisoner, and, being sent to the Tower, was not liberated until 1646, when he was given command of the English forces in Ulster. There, on account of the lack of support from the Parliament, he was unsuccessful; but Cromwell had already recognised his ability, and in 1650 made him lieutenant-general of artillery in the army in Scotland. Monk greatly distinguished himself at Dunbar, and was then left to complete the Scottish campaign. In 1652 he was appointed one of the Admirals and Generals of the Fleet, and as such commanded the white squadron at the battle of Portland in 1653. After the Dutch war he returned to his command in Scotland, where he remained until the death of Cromwell. He recognised Richard Cromwell, and was prepared to support him; but, finding that the weakness of the new Protector was leading to disorder and anarchy, Monk crossed the Border on January 1st, and entered London and invited Charles II. to return to England. On the arrival of the king Monk was created Duke of Albemarle and lieutenant-general of the

forces, and was given a perpetual pension of £7,000 a year. When a new Dutch war broke out in 1665 he was appointed joint admiral with Prince Rupert. He died in January, 1670.

Monkey. In popular language a monkey is a Primate with a tail, the term "ape" being used for tailless forms. [BABOON.] How little the tail may be relied on as a character for classification of any kind may be seen from the fact that in some macaques it is long, in others short, in one tufted at the end, and in another absent altogether. The Primates consist of two sub-orders: (1) Anthropoidea, (2) Lemuroidea. [LEMUR.] In the Anthropoidea are five families: (1) Hominidæ (Man), (2) Simiidæ (Anthropoid Apes), (3) Cebidæ (New World Monkeys), (4) Cercopithecidæ (Old World Monkeys), and (5) Hapalidæ (Marmosets). To individuals of the third and fourth families the term "monkey" is properly applied; and some authorities include the fifth family in a group with the third (Platyrrhini), the Old World Monkeys being placed in a second group (Catarrhini). These two groups are separated not only in geographical distribution, but also by anatomical characters. The nose is flat, the nostrils far apart; all are arboreal, and the tail is generally prehensile. The thumb is not opposable, and the digits bear nails instead of claws. Here belong the Howlers, Spider Monkeys, Capuchins, etc. In the Catarrhini the nostrils are near together; the tail is never prehensile, and the thumb, when present, is opposable. To this group belong the baboons, entellus, Diana monkey, macaques, etc. Only one monkey is European. [BARBARY APE.]

Monk Fish, the Angel-fish (q.v.). The name was formerly applied to a gigantic squid.

Monkswell, ROBERT PARRETT, LORD (b. 1817), was educated at Cambridge and called to the bar in 1843. He became Solicitor-General in 1863, and later Attorney-General, a post which he again assumed in 1868. In 1871 he was appointed to the Judicial Committee of the Privy Council and in 1885 was raised to the peerage. He died in 1886.

Monmouth, parliamentary borough (returning with Newport and Usk district one member), municipal borough, and market-town, and capital of Monmouthshire, is situated in a pretty valley near the junction of the Monnow (crossed by an ancient bridge), and the Wye (crossed by a modern stone bridge); 18 miles S. of Hereford, and 27 S.W. of Gloucester. It consists of one large street, running through an old gateway from Monnow bridge to the market-place, and several divergent streets. The principal buildings are the parish church, with a fine spire of over 200 feet, the grammar school, and market-house; and there are some remains of the castle in which John of Gaunt lived and Henry V. was born. The principal manufactures are iron, tin-plate, and paper, and there is a considerable trade in these products. Pop. (1901), 5,095.

Monmouth, JAMES, DUKE OF (1649-85), the son of Lucy Walters and (as is supposed) Charles II., was born at Rotterdam and educated in France at the charge of the king. After the Restoration he was called to England, and was made

K.G., Earl of Orkney and Duke of Monmouth. At sixteen he married Anne, daughter of the Duke of Buccleuch, and he became popular in the country in proportion as the Duke of York was disliked and hated. He is described by Hume as brave, affable, thoughtlessly generous, and graceful in person; but his nature was weak, and he would not have been politically dangerous but for the influence and talent of his adviser, Shaftesbury. In 1679 he commanded at Bothwell Brigg, but was deprived of his command and sent from the kingdom to please the Duke of York. On being allowed to return to England he plotted with Shaftesbury and others; but the plot was discovered in 1683, and Monmouth, after being in hiding for a time, was pardoned on promising amendment. He afterwards denied having made promises, and was again sent abroad. On the accession of James II. he embarked on his romantic but foolhardy expedition to invade England, an attempt which cost him his life, and brought much disaster on the west of England. In June, 1685, he landed at Lyme with 100 followers, and assumed the title of James II. and the next month found him, after the battle of Sedgemoor, starving in a ditch, where he was hiding disguised as a peasant. After vainly suing to his uncle for life, he died on the scaffold.

Monmouthshire, a maritime county of England, having Hereford and Brecknock on the N., Glamorgan on the W., Gloucester on the E., and the Severn estuary on the S. and S.E., and containing over 370,000 acres, most of which is arable, meadow, or pasture land. The surface is varied, being in parts mountainous and rocky, and in others consisting of fruitful slopes and plains, woods, pastures, and well-cultivated land. The Usk, with its tributary the Ebbw, flows through the county, and the Wye and Monnow are on the boundaries. The geological formation W. of the Usk belongs to the South Wales coal-fields, and is bordered by carboniferous limestone, while E. of the Usk lies the old red sandstone. The chief products are iron, coal, limestone, and other stone, the two first being of highest importance, since there are over a hundred collieries, and numerous blast-furnaces, puddling-furnaces, steel and tin-plate works, and rolling mills. A good deal of flannel and coarser cloth is manufactured. The chief headquarters of the coal and iron manufacture are Pontypool, Blaenavon, Tredegar, Rhymney, and Ebbw Vale. The chief towns are Monmouth (capital), Newport (at the mouth of the Usk), Abergavenny, Blaenavon and Tredegar. Monmouthshire was made an English county by Henry VIII. Pop. (1901), 292,327.

Monochlamydeous (from the Greek *monos*, one, *chlamys*, a cloak), is a term applied to flowers in which the perianth is represented by a single whorl of floral leaves. This whorl is generally green, or *sepaloid*, as in the nettles; but sometimes *petaloid*, as in mezereon. Such flowers occur mostly among the Incompletæ (q.v.); but not exclusively, many Ranunculaceæ, such as *Clematis*, *Anemone*, and *Caltha*, being monochlamydeous, though belonging to a dichlamydeous (q.v.) group.



MONKEYS.

Monochord, or **SONOMETER**, is an apparatus by which the vibrations of strings may be observed. A single string or wire is stretched over two pieces of wood fixed to a sounding-board. One end of the string is fixed, the other passes over a pulley and is loaded with weights. The length of the vibrating string is altered by placing a movable bridge between the two fixed ones, only that part of the string between the movable bridge and the bridge nearest to the pulley being considered. The number of vibrations of the wire per second is found to increase with the load applied, and to decrease when a greater length is used.

Monocotyledons, the smaller and, in some respects, less highly organised of the two classes of angiospermous flowering plants. In their embryos they have only one cotyledon, which generally remains within the seed (hypogeal). The radicle does not usually, except in palms (q.v.), develop into a tap-root, often not even leaving the seed but being replaced by a tuft of adventitious, unbranched root-fibres. Bulbs, corms, and seldom-branched cylindric stems [**CAUDEX**] are common in this class. There are in the stem numerous *closed* fibro-vascular bundles, *i.e.* strands of wood and bast (xylem and phloem), with no fascicular *cambium* (q.v.) or growing tissue between them, and, therefore, incapable of increase in diameter. The stems of a few arboreal forms are capable of indefinite increase in diameter, retaining a *pericycle*, or zone of meristematic fundamental tissue in which new bundles originate. This is the case in *Dracena* and *Aloe*. There is neither distinct pith nor separable bark to the stem. The leaves are commonly simple, though often very large and sometimes tearing into leaflets, as in many palms. They are without stipules, often sheathing at the base, with a glossy smooth surface, entire or distantly toothed margin, and parallel main veins. Much finer cross veins often divide the leaf into a regular network. The parts of the flower (q.v.) are generally in whorls of three, the typical floral diagram of the whole class being $3.3.3 + 3.(3)$. The seeds are generally albuminous. Some fossils apparently referable to Monocotyledons occur in Jurassic rocks; but the class is well represented for the first time in the Eocene. It is subdivided into two subclasses, *Petaloidæ* and *Nudifloræ*, mainly by the characters of the perianth, which is petaloid in the one and reduced or absent in the other. The former is divided into the two series *Hypogynæ* and *Epigynæ*, according as the ovary is superior or inferior; and the latter into the *Spadicifloræ*, which have a spadix (q.v.) or fleshy peduncle, and the *Glumifloræ*, in which the flowers are enclosed by rigid chaff-like bracts or glumes (q.v.). Among the chief orders of Monocotyledons are the Liliaceæ, Juncaceæ, Amaryllidaceæ, Iridaceæ, Orchidaceæ, Palmaceæ, Aroidæ, Cyperaceæ, and Gramineæ, many of which are separately described.

Monœcious (from the Greek *oikos*, "a house") is the term applied to plants in which the sexes, though in separate flowers or on distinct branches, are on the same individual. Some mosses (q.v.),

bearing both antheridia and archegonia, and similarly the prothallia of some ferns (*see* Fig., vol. iv. p. 277), are termed monœcious. Among flowering plants monœcism is the rule among Gymnosperms and is common among the reduced types of Angiosperms. It is the rule among the spadiceifloral Monocotyledons, and, though rarely occurring among grasses (maize being an example), is common among sedges. Among Dicotyledons, some of the nettle tribe (Urticaceæ), the hazel (Corylaceæ), oak (Quercineæ), Begonia, and most of the spurge tribes (Euphorbiaceæ), furnish examples of monœcious flowers.

Monogram, a single design, consisting of a letter or of letters interlaced or combined, especially a design formed by a person's initials. One of the most famous monograms is the interlaced X P of the labarum (q.v.).

Monolith. [**STANDING STONES**.]

Monomania. [**INSANITY**.]

Monopetalous, an inaccurate term applied to Gamopetalæ (q.v.), implying that a flower has but one petal, whereas in reality there are several, though they may happen to be united below by a corolla-tube.

Monophysites. [**COPTS**.]

Monopoly, the exclusive privilege of trading in or manufacturing a certain commodity, exercised by a government itself, or granted to a person or to persons; also the entire control of the trade in a commodity no matter how acquired. Most governments claim and exercise the monopoly of coining money.

Monotremes (**MONOTREMATA**), the single order of the sub-class Prototheria (*Ornithodelphia* of De Blainville). The animals of this order—the lowest of the Mammalia, are restricted to the Australian region, and resemble the Sauropsida (Birds and Reptiles) in having a cloaca or common passage into which the urinary, genital, and food canals open, whence the name Monotremata. De Blainville's name refers to the resemblance between the female reproductive organs and those of birds. There are but two families: Ornithorhynchidæ and Echidnidæ. [**ORNITHORHYNCHUS**, **ECHIDNA**.] These animals are oviparous, and the mammary glands, which are of a different type from those of higher Mammals, open by a mere slit on each side of the abdomen. The eggs resemble those of birds in that part of the yolk nourishes the embryo.

Monro, ALEXANDER (1697–1767), a Scottish anatomist, and founder of the Edinburgh Medical School, was born in London, and studied at Edinburgh, and in London under Cheselden, going afterwards to Paris and to Leyden, where he was a pupil of Boerhaave. In 1719 he began to lecture on anatomy and surgery at Edinburgh, and in 1720 became professor of these subjects at the university. His chief works are *Anatomy of Human Bones and Nerves*, and *Essay on Comparative Anatomy*. ALEXANDER, his son (1733–1817), succeeded to his father's chair in 1759, and was also a distinguished anatomist. He wrote on *The Nervous System*, and the *Structure and Physiology of Fishes*.

Monroe, JAMES (1758-1831), President of the United States of America, was born and educated in Virginia. He served with distinction in the Revolutionary War, adopted the practice of the law, and in 1782 became a member of the Virginia Assembly and of the Executive Council. He was member of Congress from 1783 to 1786. In 1788 he was a member of the convention for settling the Constitution of the United States, and was opposed to the extension of federal power. In 1790 he was elected to the Senate, and from 1794-96 was minister-plenipotentiary to Paris. After being Governor of Virginia in 1799, he went in 1803 as minister-extraordinary to Paris, and was instrumental in bringing about the acquisition of Louisiana. In 1811 he was Secretary of State and for War, and in 1816 was elected President, being re-elected almost unanimously in 1820. He seems to have owed his great popularity to having, in his first term of office, acquired Florida from Spain, and settled the slave boundary. The *Monroe Doctrine* (so called from his Presidential message of 1823) was substantially that the United States disapproved of any European interference in aid of Spain against her revolted South American colonies, or to any further foundation of European colonies in America. Popularly it means that the United States is a sort of guardian of the independence of the other states of America. But though perhaps implied in the recent relations of that Power and the South American states, it has never been formally acted on by the United States Government.

Mons, a Belgian town, capital of Hainault, on the river Trouille (crossed by four bridges) 27 miles S.E. of Tournai. It was once strongly-fortified, but its fortifications, like those of other Belgian towns, have been demolished, and their place is occupied by boulevards. The chief buildings are the fine churches of St. Wandru and St. Elizabeth, and the Gothic 15th-century town-hall, and there are hospitals, arsenal, court-house, school of arts, theatre, academy of music, and many educational establishments. The chief industries are the manufacture of linens, woollens, cotton, muslin, cutlery and fire-arms, and brewing and bleaching are carried on. A canal connects the town with the Scheldt, a great convenience for the trade in coal, stone, marble, horses, cattle, and corn. Mons is in the Belgian coal district, and from two to three millions of tons are annually raised in the neighbourhood, and much of this passes through the town.

Monson, SIR WILLIAM, British naval officer, was born in Lincolnshire in 1569, and, having gone to sea at the age of 16, distinguished himself almost immediately in an action with a large Spanish privateer. At the age of 18 he had a ship of his own, and in 1588 he served against the Armada. In 1596 he was flag captain to the Earl of Essex at the attack upon Cadiz, and was knighted. In 1602 he served as vice-admiral, and had the good fortune to capture a treasure-ship worth a million pieces of eight. Thenceforward he frequently went afloat as a flag officer, and was for twelve successive years in command of the Narrow Seas, in which he almost entirely put down piracy. But, in spite

of his deserts, he incurred unpopularity with the Administration because he exposed naval abuses, and with the people because, in pursuance of orders, he prevented the escape of Lady Arabella Stuart; and in 1616 excuse was found for his committal to the Tower. Yet, as nothing in the shape of a serious charge was brought against him, he was presently liberated, and speedily regained his old position of trust and influence; and as late as 1635 held active command. In his subsequent retirement he wrote his most valuable *Naval Tracts*, which throw a great flood of light upon the navies of Elizabeth, James, and Charles, and which entitle him to be regarded as the father of all our naval historians, antiquaries, and commentators. Sir William died at Kynnersley, Surrey, in 1642.

Monsoon, name of the trade winds which blow in the Indian Ocean and the adjacent lands. From April to October a strong south-west wind with rain prevails; from October to April a gentle dry north-east breeze. The change or breaking up of the monsoons is attended by violent storms.

Monstrosity. Any anomalous development of the embryo produces what is termed malformation, and when such deviation from the normal is extreme the term monstrosity is employed. Single and double monsters are described; in the case of the former the malformation affects a single individual, in the latter two embryos have certain parts in common.

Montagnais, a term applied by the Franco-Canadians to two distinct North American peoples: (1) A Hudson Bay tribe, who are a branch of the Athabaskan family, and whose proper name is *Déné* ("Men"); they roam a vast region of some 200,000 square miles between the Churchill river and the Great Slave Lake, but number at present not more than 5,000, mostly in the service of the Hudson Bay Company. (2) A Canadian tribe, who are a branch of the Algonquian family, and who represent the Tadussians, Shicoutimians, Pikwagamians, the Great and Little Mistassins and others mentioned by the early French writers. They occupied a territory of about 120,000 square miles in the Saguenay basin and the interior of Labrador, and since the time of Champlain were always steadfast allies of the French in their wars with the Iroquois. At present they are reduced to about 1,920, chiefly in the Betsiamits district, and grouped round the Catholic mission of the Pointe-Bleue Reserve on the west side of Lake St. John.

Montagu, SIR GEORGE, British admiral, was born in 1750, entered the navy in 1763, and became a captain in 1773. He assisted at Rodney's relief of Gibraltar, and in the capture of the Caraccas convoy. He was made a rear-admiral in 1794. From 1803 to 1809 he was commander-in-chief at Portsmouth, and, during that important period, by his energy and resource contributed greatly to keeping the fleets in serviceable condition. He died an Admiral of the Red in 1829.

Montagu, LADY MARY WORTLEY (1690-1762), daughter of Evelyn, Duke of Kingston, and Lady Mary Fielding, daughter of the Duke of Denbigh,

was born at Thoresby, in Nottinghamshire. She was a child of great promise, and learned Greek, Latin, and French with her brothers. At twenty she translated part of Epictetus's works, and at twenty-two she married, living for a time with her husband at Wharnccliffe, till on his becoming a minister she accompanied him to London, where she made the acquaintance of Addison, Congreve, Pope, and other men of mark. In 1716 Mr. Montagu was appointed ambassador to the Porte, and she accompanied him to Turkey, whence she wrote her well-known *Letters*. While here she adopted the Turkish practice of inoculation for the small-pox, and endeavoured to introduce it into England. In 1718 she returned to England, and, at Pope's request, took up her abode at Twickenham, where the poet and she were fast friends for a time, but then quarrelled and became as keen enemies. From 1739-61 she lived on the Continent, mostly at Venice, but at her husband's death she returned, and herself died the next year. She wrote poems of some merit, but her great point was correspondence, in which she ranks second only to Madame Sévigné among female letter-writers. Her *Correspondence*, *Poems*, *Essays*, with *Life* (6 vols.), were published in 1803, and there have been several later editions.

Montague, CHARLES, EARL OF HALIFAX (1661-1715), born at Horton in Northamptonshire, grandson of Henry Montague, 1st Earl of Manchester, was educated at Westminster school and Trinity College, Cambridge. He wrote a poem on the death of Charles II., and in 1687, with Prior, wrote *The Town and Country Mouse*. He was one of the promoters of the Revolution, and in 1692 became Lord of the Treasury. In 1694 he became Chancellor of the Exchequer, and next year carried out a system of recoinage, making Newton Master of the Mint. In 1696 he introduced exchequer bills, and then inaugurated our National Debt and assisted in the establishment of the Bank of England. In 1700 he became Lord Halifax. During Queen Anne's reign he was twice impeached by the Tories, and held no office, but was an active advocate of the union with Scotland. George I. conferred on him an earldom and the Order of the Garter. For about six months before his death he was First Lord of the Treasury. He was a poet, but is best known as a financier, a Whig magnate, and the patron of Addison.

Montaigne, MICHEL EYQUEM DE (1533-92), French man of letters, was born at Périgord, of a family of high descent. His father put him under the care of a German tutor, who could not speak French, but had to communicate with his pupil in Latin, the result being, as the father wished, that the boy grew up without learning French, and had to learn it as a foreign tongue. He learnt Greek in the ordinary way, though in this case, too, the father had wished to employ an exceptional method. As to moral training, the father put little restriction upon him, but endeavoured to make him refer everything to a standard of right and wrong. Later he was sent to the college of Bordeaux, and after that studied law for a time; but this did not suit him, and he found the contemplation of human

nature the only pursuit that interested him. He travelled in Germany, Switzerland and Italy, and in 1581 was made a citizen of Rome. In 1582 he was mayor of Bordeaux, but was soon glad to escape to his castle and philosophy. During the Huguenot trouble he was so unfortunate as to displease both sides, and to suffer at their hands, while in 1586 the plague drove him away from his home. After, however, a stay in Paris he returned home for the latter part of his life. Although from the circumstances under which he learnt French Montaigne never attained the highest purity of style, he has a style of his own, bold and original. He had strong views upon educational questions, but his general attitude as to life and morals was a tentative one; *Que sais-je*, was his motto. Of his celebrated *Essays* there are two English translations, and biographies of him have been written both in English and in French. His *Voyages* (partly written in Italian) were published 200 years after his death.

Montalembert, CHARLES FORBES, COMTE DE (1810-70), French politician, historian, and theologian, was by his mother's side of the Scottish family of Forbes, hence his knowledge of English, and his fondness of the English social system. He was a curious mixture of ardent liberal with aristocratic instincts, and Ultramontane Catholic. Along with his comrade Lacordaire, and the Abbé Lamennais, he indulged in dreams of a democratic theocracy, an alliance between Catholicism and liberty, and in 1830 he started a paper, *L'Avenir*, taking as its motto "God and Liberty." In 1831 Lacordaire and Montalembert together started a public school without permission of the Government, the result being a prosecution, and a brilliant speech in defence by Montalembert, their only punishment being a fine of 100 francs. In 1832 the Pope condemned *L'Avenir*, and Montalembert abandoned some of his liberal ideas, and gave himself more fully to Ultramontanism. About 1836 he became a member of the Chamber of Peers, and distinguished himself as a defender of the freedom of the press. In 1843 he went to Madeira, where he studied the history of St. Bernard. At this time he was known as an eloquent orator, a defender of the episcopate, and an acknowledged chief of the Catholic party. He was a strong advocate of the freedom of Poland, of the Greeks, of the Syrian Christians, and of Ireland. For the sake of the clerical party he joined the party of reaction after 1848, but he defended Louis Napoleon against unjust accusations. In 1852 he became an Academician, and in 1857 he retired from public life. The chief work of his later years was contributing to *Le Correspondant*, in whose columns he vigorously attacked M. Veuillot. In 1869 he was opposed to the dogma of infallibility, and a few days before his death wrote a striking letter as to the power of the Vatican. His works (of which *Les Moines de l'Occident* is perhaps the best known) have been published in 9 vols. An interesting little piece of his is *La Grammaire et le Dictionnaire*, a discourse on the study of language.

Montana, one of the United States of America, was formed into a territory in 1864 out of Idaho

and Dakota, and became a state in 1889. It has the British possessions on the N., and contains 146,000 square miles. Besides the white population, there are over 10,000 Indians on the reservations. It is generally mountainous, and is crossed by the Rocky Mountains. Its rivers are the Missouri, the Yellowstone, and a branch of the Columbia. The eastern part is a dry, sterile plateau, but the river valleys of the west are very fertile. Owing to the scanty rainfall, irrigation is necessary for agriculture, which is increasing, and the good grazing grounds support quantities of wild stock. Montana is very rich in gold and silver, and produces also lead, copper, iron, and coal. Among its animals are the grizzly bear, Rocky Mountain sheep, moose, and antelope; and there are fine forests of pine, fir, and cedar. The North Pacific Railway runs through the state from E. to W. The capital is Helena.

Montanism, the tenets of a very ascetic sect founded by Montanus of Phrygia in the second century, who believed in the inspiration of their founder, in the continuance of miraculous gifts, and in the near approach of the Millennium with the New Jerusalem at Peruza in Phrygia. They became extinct in the 4th century, except a Gaulish remnant which lasted into the 5th century.

Montauban (MONS ALBANUS), a French town, capital of the department Tarn and Garonne, on the Tarn, and 342 miles south-west of Paris. It is on a table-land surrounded by the Tarn and the Tescou. It is well built, and contains a cathedral, a bishop's palace, and a town-hall. It was formerly a stronghold of the Huguenots, having been besieged in 1580 and 1621, and finally taken by Richelieu in 1629, when its walls were demolished. There is still a Protestant academy and theological college. The chief productions are silk cloths, cloths, colours, porcelain, starch, and candles, and there are spinning-mills, dye-works, and potteries.

Mont Blanc, the highest (excluding the Caucasus) mountain height of Europe (15,781 feet), is in the Pennine Alps on the frontiers of France, Italy, and Switzerland. The summit and most of the chain, which has a S.W. and N.E. direction, are in the Haute-Savoie. The N.E. part of the chain is in Switzerland, and the boundary-line of France and Italy runs along it. The S.E. presents a precipitous face, but from the N. or S. its shape is pyramidal. The chief glaciers which it contains are on the N.W. slope, among them being the Des Bossons, du Bois, du Taléfre, and the Mer de Glace. The rock composing the central mass is protogine. Jacques Balmat was the first to ascend the mountain (in 1786), since which period it has been climbed times without number.

Montcalm, LOUIS JOSEPH, MARQUIS DE (1712-59), a French general, was born near Nîmes. He entered the army at fifteen, and in 1746 was wounded and made prisoner at Piacenza. Ten years afterwards he was appointed to the command of the French troops in Canada, and in this capacity he captured Oswego from the British. In 1757 he crossed Lake George, and with a mixed

army of his own men and Indian allies he took Fort Henry, allowing the garrison free exit with the honours of war. The massacre of the garrison which followed, at the hands of the Indians, whom he could not control, has been graphically described by Fenimore Cooper. In 1758 Montcalm successfully defended Ticonderoga against General Abercrombie, and after different losses he finally defended Quebec until its surprise by General Wolfe. In the battle which followed upon the Heights of Abraham he, like Wolfe, was mortally wounded, and died next day.

Mont Cenis is a pass in the Graian Alps, and lies between Savoy and Piedmont. The road was constructed by Napoleon I., and at the top is a plain containing a hospice, and a lake which abounds in large trout. The noted tunnel of Mont Cenis, which unites France and Italy, is really 15 miles to the south-west of Mont Cenis, and passes under the Col de Fréjus. The construction of this tunnel, nearly eight miles long, was a splendid engineering feat, and required fourteen years for its completion (1857-71).

Monte Carlo, in the principality of Monaco, is both famous and infamous for its gambling establishment, which is a fashionable resort for players from the whole civilised world, and supplies most of the revenues of the state.

Monte di Pietà, "fund of piety," a pawnbroker's establishment instituted and maintained by public authority. The first establishment was started in 1496 at Florence.

Montefiks, the most numerous and powerful of all the Mesopotamian Arabs, whose territory comprises a great part of the province of Baghdad along the banks of the Lower Euphrates between Korna and Samavat; two main sections, Ajwâd and Beni Malek, whose genealogies show direct descent from the old Zaltân tribe of Lower Chaldæa, and who after fusion of the two took the name of *Montefik*, i.e. "United." The chief family claims descent from Maneh, an old Sherif of Mesca. Originally nomads, most are now settled, their chief stations being Nazrieh and Suk-esh-Sheyokh. Even the Beni-Malek, who still live in tents, have also fixed residences in the tribal villages. The Montefiks have often given trouble to the Turkish authorities, whose jurisdiction has till recently been little more than nominal.

Montefiore, the name of an eminent Jewish family which has made a name both in England and abroad. The best known in England of the family is SIR MOSES MONTEFIORE (1784-1885). He was born in Leghorn, where his parents, settled in England, were for the time staying. In 1812 he married Miss Judith Cohen, who was his worthy partner in his many works of benevolence. He set himself vigorously to work to remove the political disabilities which beset Jews in England, and with considerable effect. He himself served as High Sheriff of Kent, and in 1837 was elected Sheriff of London, being knighted in the same year. He received his baronetcy in 1846. He always interested himself on behalf of his nation, and in

Poland, Russia, Roumania, and Damascus he did much to ameliorate their condition. On their behalf he undertook many journeys to the East, the last being in 1874, when he was already greatly advanced in age. In his later years he was a well-known and highly-respected inhabitant of Ramsgate, where he founded the Jewish College, and his 99th birthday was made the occasion of almost universal congratulation.

Montem, the name of a custom which the scholars of Eton College used (until 1847) to hold every third year on Whit Tuesday. They went in procession gaily dressed and with flags and a band, to a mound (*ad montem*) near the Bath road, still called Salt Hill, after the collection of "salt" or money for the captain of the school.

Montenegro (Turkish KARADAGH, native TCHERNAGORA, each name meaning "black mountain") is a principality in the N.W. of Turkey in Europe, having Bosnia and Herzegovina on the N., Bosnia on the E., Albania on the S., the Adriatic Sea and part of Dalmatia on the W. It has an area of 3,486 square miles, and consists of elevated ridges interspersed with peaks varying from five to eight thousand feet high, and presenting an appearance that has been likened to a sea of waves turned into stone. There are fertile plains and valleys, such as Tzernitza and the valleys of Bielopavlich, which are watered by several streams, the chief being the Moratsa, which flows into Lake Scutari. The hills are clothed with valuable forests of oak, beech, ash, holly, sumac, and other trees. There is not much game, but fish abound, especially large trout and carp, which are salted and exported to Vienna. Agriculture and fishing are the chief pursuits, and there are hardly any manufactures beside that of a coarse kind of cloth. Sheep, goats, and pigs are reared, and maize, tobacco, cabbages, cauliflower, potatoes, walnuts, and many kinds of fruit, such as peach, pomegranate, mulberry, olive, almond, apple, are grown. The chief exports are mutton-horns, salt fish, sardines, sumac, cattle, hides, and agricultural and dairy produce. The capital, Cetigne, or Cetinje, is only a large village, and there are two ports, Antivari and Dulcigno. The bulk of the population is a Servian branch of the Slavonic race, of the orthodox faith, and they speak a Slav dialect. They are a tall, robust race, of simple habits, and are accustomed to go about fully armed. There are also about 10,000 Mohammedans in the district added to Montenegro in 1878 by the Treaty of Berlin. The country has a chequered history, and has had a long struggle to maintain its independence, now secured.

Monte Rosa is a peak, or rather a group of peaks, in that part of the Pennine Alps which separates the Swiss canton of Valais from Italy. The Dufourspitze (15,217) is the highest summit, and was first successfully ascended in 1855.

Montespan, FRANÇOISE MARQUISE DE (1641-1707), daughter of the Duke of Montemar, was one of the mistresses of Louis XIV. of France. She married in 1663, and was witty, lively, cultivated,

and beautiful. In 1668 she came to court and soon supplanted Louise de la Vallière, who finally retired in 1674. Her first child by the king was born in 1672, and was committed to the charge of Madame Scarron, afterwards Madame de Maintenon (q.v.). For a long time the marquise had great influence with the king, till at last she was supplanted by Madame de Maintenon. After 1685 she was seldom at court, and finally quitted it in 1691. Like most of the king's mistresses, she took to piety and penitence.

Montesquieu, CHARLES, BARON DE (1689-1755), a French author, was born at the castle of Bréda, near Bordeaux. He was studious in youth, and at the age of twenty had begun to amass materials for his great work, *Esprit des Loix*. Having inherited property from his uncle, he lectured on history at the Academy of Bordeaux, and tried to introduce the study of natural science. In 1721 appeared his *Lettres Persanes*, which gave great offence in some quarters by their original, lively, and at times irreverent, satire. He was admitted to the Academy in 1728, and then he started to travel and study the institutions of Germany, Italy, Hungary, Switzerland, Holland, and England, where he resided two years. In 1734 appeared his *Causes de la Grandeur et de la Décadence des Romains*, and in 1748 his *Esprit des Loix*, which embodied his political studies. He treats of society from the democratic, the despotic, and the monarchical points of view; of the effects of rewards and punishments; of the influence of religion, education, commerce, climate, and physical surroundings. His work has been described as a code of natural law, and himself a legislator for humanity. His *Lettres Familières* appeared in 1767, and his *Œuvres Posthumes* in 1798. There are many editions of his works, one of the best being that published in Paris (7 vols., 1875-79). Montesquieu was of amiable private character, and stories are told of his unostentatious generosity.

Monte Video, a seaport of South America, capital of Uruguay, on the north coast of the La Plata, 130 miles S.E. of Buenos Ayres. It is situated on a moderate elevation at the end of a small peninsula, and is divided into a new and an old part, marks of old ramparts between them still being visible. The streets are regular and well paved, with a good tram-service, and the houses, of one and two storeys, are flat-roofed. Among the chief buildings are the cathedral, town-hall, exchange, and market. The harbour is very shallow, but the bottom is soft, and the vessels—chiefly British—that trade there take little harm by grounding. The principal exports are wool, timber, tallow, jerked-beef, and essence of meat; and the imports woollens, cotton, hardware, and coal. The climate, though damp, is on the whole pleasant and wholesome. The heat in summer is oppressive, and the weather in winter sometimes rough, with keen, piercing air. The soil in the neighbourhood is fertile, and produces many vegetables, and both meat and fish are abundant and cheap.

Montez, LOLA [MARIA DOLORES] (1818-61), was born in Limerick, daughter of an English

officer and a Spanish lady. She went to India, where her father died, and then returned to Europe, and, to escape an uncongenial marriage, she eloped with a Captain James. This marriage ended in a separation, and in 1842 she was again in India. She then went on the stage, and appeared at Her Majesty's theatre, and then made a tour of Europe till, in 1846, she became the favourite of Louis I. of Bavaria. The king made much of her, and her influence was great, but the revolution of 1848 sent her again on her travels. Her next sphere of operations was the United States, where she was married three times. Then after a tour in Australia she began lecturing in New York. The last years of her life were spent in penitence, and she died at Long Island.

Montezuma, Emperor of Mexico in the 16th century at the time of the Spanish conquest. In 1519 he was cowed by an old prophecy, and received Cortes (q.v.) after the conquest of the Tlascalans as a divine being, but when he found the Spaniards to be but mortal, he plotted, and Cortes seized him, made him acknowledge the king of Spain, and kept him in chains, forcing him to witness the torture of his subjects and friends. On the occasion of a rising, Montezuma in royal robes was brought forward to try to pacify the people, and was struck by a stone thrown by one of his indignant subjects. From the effects of this wound, or from a broken heart, he died in 1520. His children were converted, and one of them became the founder of a family of Spanish nobility, the last representative of which died at New Orleans in 1836.

Montferrat, once a duchy of Italy between Genoa, Piedmont, and Milan, lying in two detached portions between the Maritime Alps and the Po, and containing 1,000 square miles. Its capital was Casale. A Marquis of Montferrat existed in 980, and in 1536 Charles V. granted the territory to the Duke of Mantua. It was made a duchy by Maximilian in 1574. In 1631 part was ceded to Savoy, and the rest was annexed by the Emperor Joseph in 1708.

Montfort, SIMON DE (circa 1200-65), was the son of the Simon who harried the Albigenes. He was born in France, but came early to England, where, through his grandmother, he had a claim to the earldom of Leicester. He did not obtain the earldom till it was granted him by Henry III. in 1231. In 1238 he married the king's sister, the Countess of Pembroke, and was soon after made seneschal of Gascony. His harsh rule drove the people into revolt, and he was recalled, and had a violent scene with the king. A reconciliation followed, and De Montfort was employed on military and diplomatic service. He joined the discontented barons, and took part, in 1258, in the Mad Parliament, which resulted in the Provisions of Oxford. For some years he presided over the twenty-four barons, who managed the affairs of the kingdom. After the battle of Lewes, in 1264, De Montfort, possibly in consequence of dissensions among the barons, took the step which has identified his name with the history of Parliament—namely, the

summoning of the Commons to send members to join in the deliberations. Like many other great measures, this was entered upon in probable unconsciousness of its important bearing upon the future, regard being had only to its immediate advantages. The Parliament met in 1265, and in this same year De Montfort was slain at the battle of Evesham. He was long regarded as a saint by the people.

Montgomery, JAMES (1771-1854), poet, was born in Ayrshire, where his father was a Moravian minister, and was educated at a Moravian school near Leeds. In 1792 he took work with a bookseller at Sheffield who owned and edited the *Sheffield Register*. Fear of the libel laws caused the editor to abscond, and Montgomery took on the editing of the paper, which now appeared as the *Sheffield Iris*. In the conduct of this paper he incurred two terms of imprisonment, which resulted in the appearance of *Prison Amusements* (1797). In 1806 he published *Wanderer in Switzerland*, followed in 1809 by the *West Indies*, a poem on the slave-trade, in 1813 the *World before the Flood*, in 1819 *Greenland*, a missionary poem, and in 1827 *Pelican Island*. Among these volumes were scattered many smaller pieces. He retired from the *Iris* in 1825.

Montgomery, ROBERT (1807-55), poet, was born at Bath, and when quite young published a weekly periodical called *The Inspector*. In 1827 he published a satire, *The Age Reviewed*, in 1828 an epic, *The Omnipresence of the Deity*, which was severely criticised by Macaulay in the *Edinburgh Review*, and shortly afterwards *Satan*, from which he gained the nickname Satan Montgomery. He then went to Oxford, and took orders. *The Messiah*, *Luther*, and *The Sanctuary* are later poems of his, and several of his hymns have been very generally adopted for congregational use.

Montgomeryshire, an inland county of North Wales, 40 miles long by 33 miles broad, and containing 773 square miles, one-third of which is pasture. It has Denbigh on the N.E., Merioneth N.W., Salop E., Radnor S., and Cardigan S.W. The surface is broken and undulating, and in parts mountainous, especially where it rises towards Plinlimmon on the borders of Cardigan. In the N.E. are the Berwyn Mountains, and towards the English border are the Breidden Hills, near Shrewsbury. Much of the land is barren, but there are fertile, well-wooded valleys, and oats and fruit are grown, while large flocks are fed upon the uplands. The rivers are the Severn, with its tributaries the Vyrnwy (the valley of which has been turned into a reservoir for the Liverpool water-supply) and the Dovey or Dyfi (noted for its fish), and the Wye which flows into Radnor. In the wide river valleys much oak and other timber is found. A canal, 27 miles long, connects with the Ellesmere Canal, and gives communication with Chester and Shrewsbury. The mineral products are lead, zinc, slate, and limestone, the first being the most important. Welsh flannel is manufactured at Newtown, and woollen cloth in most of the towns. Llanidloes and Welshpool are municipal boroughs.

The county town, Montgomery (seven miles S. of Welshpool and 53 miles N.W. of Birmingham), is on the Severn. It has a fine Early English cruciform church, and on a hill above are the ruins of a castle held by Roger de Montgomery. The county returns one member to Parliament, and the boroughs return one. Pop. (1901) of the town, 1,034, of the county, 54,892.

Month, originally (and when described as lunar) the interval between one new moon and the next, containing 29·530589 days. A solar month is the twelfth part of the solar year, containing 30·43685 days. A calendar month is one of the twelve divisions of the civil or calendar year, of which April, June, September, and November contain 30 days, February 28 (in leap year 29) days, the rest 31 days. Astronomers also use the terms anomalistic month, draconitic or nodical month, sidereal month, and tropical month, all with respect to revolution of the moon about the earth.

Montholon, CHARLES TRISTAN DE, COMTE (1782-1853), the companion and historian of Napoleon's captivity at St. Helena, began his career in the French navy. He afterwards entered the army, and was wounded at Wagram. He was made Imperial Chamberlain in 1809, and was Adjutant-General during the Hundred Days. Having been named chief of the staff by Louis Napoleon in 1840, he was condemned to twenty years' imprisonment, but was released in 1848. He published *Mémoires pour servir à l'Histoire de France sous Napoléon, écrits à Ste.-Hélène sous sa dictée* (1822-25), and *Récits de la Captivité de Napoléon* (1846).

Monthyon Prizes, prizes awarded annually in Paris under the will of a French lawyer, Baron de Monthyon, who died in 1820. He bequeathed 10,000 francs for an annual prize for the discoverer of any mode of diminishing the unhealthiness of a mechanical art, and 10,000 francs for an annual prize for the inventor of any means of perfecting medical science or surgery, to be awarded by the Academy of Sciences; also 10,000 francs for the French person who shall have performed the most virtuous action during the year; and 10,000 francs to the French person who shall have published in France the book most beneficial to morals, to be awarded by the French Academy.

Montmorency, MATTHIEU DE, was Constable of France and regent during the absence on crusade of Louis VII., whose mother was his second wife. He died in 1160. His son, MATTHIEU, Grand Constable of France, distinguished himself at the battle of Bouvines, and was a leading personage during the reign of Louis VIII. and the early years of Louis IX. He died in 1230. ANNE (1493-1567), first duke and Constable of France, was the best general of Francis I. in his wars with Charles V. He was taken prisoner at Pavia, but after his liberation successfully defended Marsilles against the Emperor (1536). Under Henri II., besides other services, he captured Metz, Toul, and Verdun, but was made prisoner at the battle of St. Quentin (1557). In 1562, at the battle of Dreux, he was again made prisoner, and in 1567 was mortally

wounded at the battle of St. Denis. His grandson, HENRI (1595-1632), Constable and marshal, after a distinguished military career in the Huguenot wars, took part in the conspiracy of Gaston of Orleans, and, being defeated and captured at Castelnaudary, was executed.

Montpellier, a city of southern France, capital of Hérault, stands on a slope about six miles from the sea, 75 miles N.W. of Marseilles. The town was granted by Louis IX. the privilege of free trade with the rest of France, and from this time its prosperity grew more rapidly. In 1350 it passed from the house of Aragon to that of Valois. In 1536 it became an episcopal see, but in the next century was one of the strongholds of the Huguenots. It was captured by Louis XIII., and some years later suffered under a terrible plague. The cathedral, which was restored in the early part of the 17th century, is one of the largest churches in the south of France. Montpellier also has a university (founded in 1292 by Pope Nicholas IV.), a famous medical school, dating from a still earlier period, and the oldest botanical garden in France. There are also some fine scientific collections and a splendid museum. The Place du Peyron, a magnificent square, with a terrace looking on the Mediterranean, is celebrated for its gateway (a triumphal Doric arch), and for two promenades leading to the boulevards. Montpellier has large manufactories of wax-tapers, candles, and soap, and does a large trade in wine and brandy.

Montpensier, LOUISE D'ORLÉANS, DUCHESSE DE (1657-93), was daughter of Gaston, Duc d'Orléans and niece of Louis XIII. Disappointed in her wish to marry Louis XIV., "Mademoiselle" revenged herself on Mazarin by her warlike exploits. In the second Fronde she herself commanded an army, captured Orleans, and afterwards took possession of the Bastille. After the battle of the Faubourg St.-Antoine (1652) she lived in the Luxembourg and mediated between the Royalists and the Frondeurs. She married the Duc de Lauzun; but his cruelty caused a separation, and she became *dévot*. She left *Mémoires* which are of great historical interest. [ORLEANS.]

Montreal, the largest city in Canada, stands on an island at the junction of the St. Lawrence with the Ottawa river. It derives its name from Mount Royal, a mass of rock 700 feet high, which rises behind the city. It was first visited by Jacques Cartier in 1535. Later on in the century De Champlain arrived; and in 1665 it was first garrisoned with the French troops, fortified, and made a centre of the fur trade. It remained in the possession of France till 1759. In 1776-77 it was for a few months occupied by the Americans. The city is partly Catholic and French, partly Protestant and English. The Romanists have a fine cathedral and a Jesuits' church. Christ church is a Protestant building in the Decorated Gothic style. The city-hall is in the modern French style. The Hôtel Dieu Hospital will hold 3,000 patients, and is served by nuns. The Bonsecours market, surmounted by a dome, is also a striking feature of the city. Among educational institutions are the

McGill College, founded in 1813; the Catholic seminary of St. Sulpice; and the McGill and Jacques Cartier normal schools. The harbour of Montreal is a fine one; its quays and wharves extend for more than a mile along the river. Numerous engine-works, saw-mills, tool-factories, etc., are worked by the water-power derived from the falls above the town. There are also many woollen- and cotton-mills, boot and shoe and tobacco factories; and sugar-refining is an important industry. The Victoria Railway Tubular Bridge, more than 9,000 feet long, connects the city of Montreal with St. Helen's and Nun's islands. The water supply of the city is obtained from a reservoir excavated out of the rock on Mount Royal. Most of the buildings are made of grey limestone. Montreal is represented in the Dominion House of Commons by three members, and in the Quebec legislature by the same number.

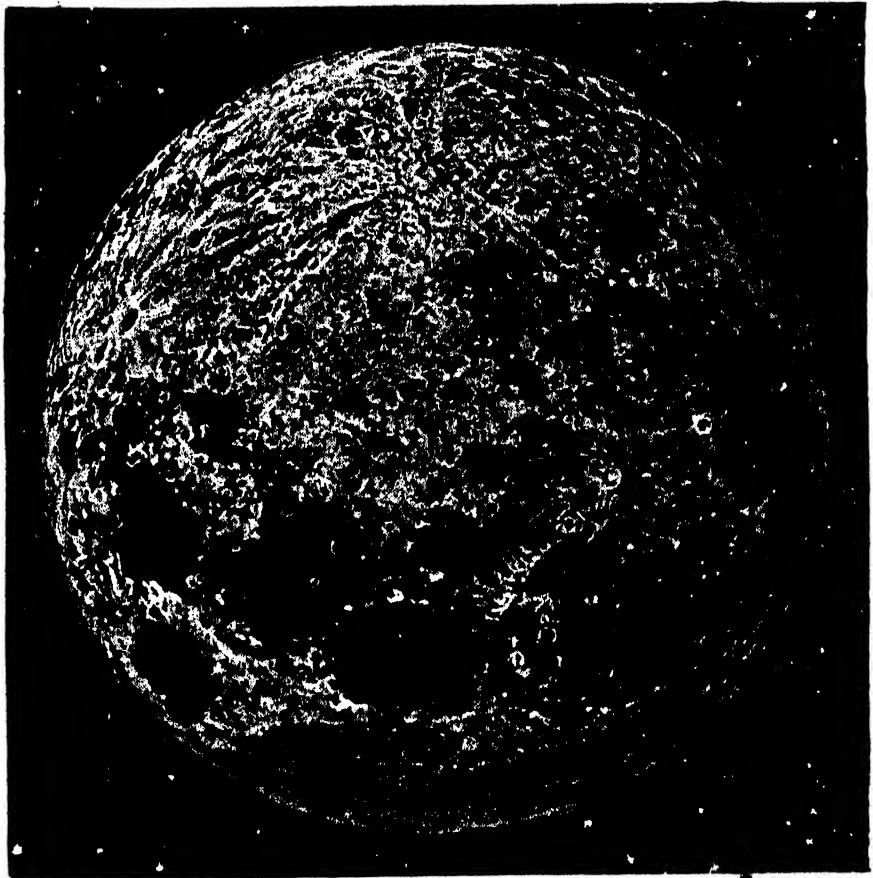
Montrose, JAMES GRAHAM, 5TH EARL AND 1ST MARQUIS OF (1612-50), came of an ancient family from Montrose, in Forfarshire. He first became an important figure in Scotland when, in 1637, he took part in the drawing up of the Covenant. For the Presbyterians he won the victories of Stonehaven and the Bridge of the Dee, and in 1640 was with the Scottish army which invaded England; but about this time he was gained over by Charles I. By the influence of Hamilton and other enemies he was imprisoned in Edinburgh Castle by order of the Scots Parliament. After his liberation he appeared openly on the Royalist side, and in the brilliant campaign of 1644-45 won six victories, and advanced towards the Border to help Charles I. in England. His Highland forces, however, deserted him in order to secure their booty, and the remnant of his army was surprised and defeated by David Lesley at Philiphaugh (September, 1645). Montrose now passed three years on the Continent, but on the news of the execution of the king again landed in Scotland and tried to raise the Highlands. He was, however, routed at Invercarron, in Ross-shire, and having been captured soon after, was hanged at Edinburgh, where a monument was raised to him in St. Giles's in 1888.

Montserrat. 1. A mountain in Spain, 4,057 feet high, is 30 miles N.W. of Barcelona. Half-way up the slope is a Benedictine abbey with a celebrated miracle-working image of the Virgin. In 1811 the abbey was plundered by the French troops, who also put to death the hermits and monks who had received French *émigrés*. In 1827 Montserrat was a Carlist stronghold.

2. One of the British West India islands, belonging to the group of the Lesser Antilles, has an area

of 32 square miles. Discovered by Columbus in 1493, it was colonised by Great Britain in 1632, and has been in her possession ever since, except for short intervals in time of war. Lime-juice and sugar are the chief products of the island, which is considered the healthiest in the West Indies.

Moody, DWIGHT LYMAN, was born in 1837 at Northfield, Massachusetts. In 1856 he began his missionary work while in business at Chicago. In 1873 he came to England, accompanied by a singer named Ira David Sankey, whom he had met three years before, and attracted large crowds to his services. In 1883 they again came to England.



PHOTOGRAPH OF THE MOON.

Moody published several popular devotional works. He died in 1899.

Moon, THE, the satellite of the earth, is the nearest to us of all the heavenly bodies, being at a mean distance of 240,000 miles. Its diameter is 2,153 miles and, its density being little more than half that of the earth, the force of gravity at its surface is very much less than that at the surface of the earth. A body which weighs a pound here would only weigh about $2\frac{1}{2}$ ounces if taken to the moon. Her path is approximately an ellipse with the earth in one focus. [For the causes affecting its motion see LUNAR THEORY.] Its apparent motion in the sky is from west to east, but she moves much faster than the sun, taking about 27 days 8 hours to travel all round the earth. The time between two successive new moons (synodic period or lunation) is $29\frac{1}{2}$ days. The reason of the difference is that the sun

slowly moves in his annual course through the stars in the same direction as the moon, which therefore in its revolution round the earth has to overtake him when it returns. The moon rotates on its axis in the same time as it performs a revolution in its orbit; hence the same half is always turned towards us. [LIBRATION.] Except at opposition—i.e. when the earth is between the moon and sun—the whole of the moon's disc does not appear bright to us, and the amount of the bright surface seen by us is found to depend on the relative positions of moon and sun. Half of the moon is always illuminated by the sun; but when it is in conjunction between the earth and sun the whole of the bright surface is on the side away from us; so that the moon is invisible. As it moves farther from the line joining earth and sun, a small portion of the bright side comes into view as a narrow crescent. This increases till half the disc is illuminated, when the lines joining earth and moon and earth and sun are at right angles. From this time the moon loses its crescent shape and becomes convex on both sides, or gibbous—the maximum brightness, or full moon, occurring when sun and moon are on opposite sides of the earth. After this the moon becomes gibbous, then crescent, and vanishes before the time of new moon. These are known as the *phases* of the moon. If the moon's orbit coincided with the ecliptic there would be a solar eclipse at every new moon and a lunar eclipse at every full moon; but the inclination of the lunar orbit allows the moon to be sometimes as far as 5° on either side of the sun. It is only when the moon is near one of its nodes (q.v.), at conjunction or opposition, that an eclipse can occur. Every year there must be two solar eclipses, and may be five, while there may be three lunar eclipses or none. From the fact that when a star passes behind the moon the rays from the star are not refracted at the moon's edge, it has been deduced that no atmosphere surrounds the moon. Its surface is seen to be very irregular, and the dark and light parts were thought in earlier times to be seas and continents; but there is now evidence which renders the absence of water certain. Mountains there are, as is proved by the shadows of them cast by the sun, and measurements of these shadows have shown that some of the mountains exceed an altitude of two miles. Many of them appear to have huge craters, often ten miles across, and others form circular rings round low-lying plains. The moon has long been known to have an effect upon the tides, and may perhaps influence the winds. It is of enormous importance to navigators for the determination of longitude, and hence its movements have been investigated with the greatest care and precision.

Moonwort (*Botrychium Lunaria*), a somewhat uncommon British plant, forming with the adder's-tongue (*Ophioglossum vulgatum*) our only representatives of the Ophioglossaceæ, a group closely related to the ferns. The prothallus is subterranean, colourless, and monocious, as in club-mosses; the stem short, erect, and unbranched, and there is generally only one leaf. This takes five years to

develop, has a long stalk, is leathery and smooth, and divides at an early period into two branches. One of these is green and barren, and gives its name to the plant by dividing pinnately into half-moon-shaped segments; the other is also pinnate, but has no green cellular tissue, consisting entirely of globular sporanges, each formed from a group of cells (*eusporangiate*) taking a year to develop and bursting in two halves.

Moor, one of the most confusing terms in ethnology. *Mauhart* (whence the Greek and Latin *Mauri*, *Mauritania*) was a Phœnician word meaning "Westerns," originally applied by the Carthaginians to the Hamitic (Berber) aborigines of the Atlas region, stretching west of Carthage. Later it was transferred in its modern forms (*Maures*, *Mori*, *Moors*) to the Arabs and Berbers of the same region indifferently, and then in a vague way to all Africans, and especially to Mohammedan Africans—the mediæval Arabs and Berbers being all Mohammedans. Then all Africans being popularly "Negroes," a Moor became a Negro, or at least a person of black colour (as in "Blackamoor"), and "the Moor of Venice," supposed to be a black (though in the original merely a swarthy Arab or Berber of the Barbary States), one of those Mohammedan "renegades" often employed in the service of the Christian Powers. The colour idea became fixed, and in the popular fancy a Moor is still a Negro; but locally the word has partly recovered its original meaning, and in the Atlas regions it is now commonly applied to the "civilised" Arabo-Berber urban populations in contradistinction to the wild hillmen and the nomads of the desert. In this more correct sense it travelled round the Continent with the Portuguese, for whom the civilised Mohammedan peoples of the east coast were all "Mauros"; and at present the half-caste Moslem Arab communities of Malabar, Ceylon, and Malaysia are similarly called Moors or Moormen by the Dutch and English. In Ceylon especially they are numerous, settled chiefly on the northern coastlands, where they have a monopoly of the local retail trade. Other applications of the word—as by the French to some of the Senegal peoples, generally find their explanation in the fact that those thus designated present social and religious features analogous to those of the present Mauritanian populations.

Moore, SIR GRAHAM, British admiral, was born about the year 1765, and, having entered the royal navy, became a post-captain in 1794. He was senior officer of a squadron which in 1804 captured three Spanish treasure-ships and sank a fourth. In 1812 he attained flag rank, and assumed chief command in the Baltic. He was afterwards for four years a Lord of the Admiralty, from 1820 to 1823 commander-in-chief of the Mediterranean, and from 1839 to 1842 port admiral at Plymouth. He died an admiral, a G.C.B., and a G.C.M.G., in 1843.

Moore, SIR JOHN, BART., British admiral, was born in 1718. At ten years of age he was sent to sea, and, having plenty of family influence, was made a captain at the age of twenty-five. In

1747, with Rear-Admiral Hawke, he participated in the highly successful action with a French squadron off La Rochelle. In 1756 he was a member of the court-martial that tried Admiral Byng. In 1757 he hoisted a broad pennant, and took command of the Leeward Islands station, but his main service to his country was his capture of Guadaloupe on May Day, 1759. Captain Moore, who soon afterwards returned to England, became a rear-admiral in 1762. In 1766 he was created a baronet, and later in the same year was appointed port admiral at Portsmouth. He died in 1778.

Moore, SIR JOHN (1761-1809), the well-known general, was the eldest son of DR. JOHN MOORE (1730-1802), the author of *Zeluco*. Entering the army in 1777, he served in the American War and in Corsica, and in 1796 captured St. Lucia, of which island he became governor. In 1797-98 he was employed in Ireland; was wounded in the expedition to Holland in the following year; and in 1800 commanded the reserve in Egypt under Sir Ralph Abercromby. He afterwards served in Sicily and Sweden, and in August, 1808, went to the Peninsula. In October he was given the command of an army destined to co-operate with the Spanish forces. Having advanced as far as Salamanca, he was obliged to retreat towards the coast, whither the French followed him. When on January 13, 1809, the British reached Corunna, their transports had not arrived; and three days later they were brought to bay by the French. The latter were defeated, and the British troops were able to effect their embarkation, but without their leader, who was mortally wounded. Sir John Moore was buried on the field of battle; but monuments were raised to him in St. Paul's and (by the French marshal Soult) at Corunna.

Moore, THOMAS (1779-1852), was the son of a Dublin grocer. In 1794 he entered at Trinity College, where he associated with Robert Emmet, and displeased the authorities by his revolutionary proceedings. After taking his degree he, in 1799, came to London, and entered at the Middle Temple. In the following year he issued his translation of Anacreon, and in 1801 published a volume of poems under the pseudonym "Thomas Little." In 1803 he obtained through Lord Moira the post of registrar of the Admiralty Court of Bermuda, but immediately appointed a deputy, and, after a tour in Canada and the United States, returned to Europe in 1806. Jeffrey's criticism of Moore's *Odes and Epistles* led to a bloodless duel and a fast friendship, and an intimacy with Byron followed a few years later. His *National Airs* appeared in 1815, and in 1817 *Lalla Rookh* was published. In 1819, in order to avoid the arrest with which the defalcation of his Bermudan deputy threatened him, he went on a Continental tour in company with Lord John Russell, the future editor of his *Memoirs and Correspondence*. Whilst on a visit to Byron at Venice he received from the poet the MS. of his autobiography, which Murray purchased, but afterwards decided to destroy. Moore now lived for a few years at Paris, where his *Loves of the Angels* and *Epicurean* were written. He returned to his

house at Sloperton in 1822, and here composed his lives of Sheridan, Lord E. Fitzgerald, and Lord Byron. In 1835 he received a pension from Lord Melbourne. In his last years his faculties decayed.

Moorhen, or WATER-HEN (*Gallinula chloropus*), a common British Rail, with a wide range in Europe, Africa, and Asia, having close allies in America and Australia. The total length is about a foot; the general plumage is olive-brown and purplish-grey, with some small patches of white. These birds frequent ponds and streams, generally nesting in the flags and reeds on the banks. They swim and dive well and feed on aquatic vegetation, worms, molluscs, and small fish.

Mooring. To moor is to confine or secure a ship, otherwise than by a single anchor, in a particular situation. Mooring may be effected either by letting go two anchors in such a manner that the strain on the two is equally divided, or by shackling one or more of the ship's cables to a buoy, or to anchors that have been previously placed in position, or to "chain mooring." These are an assemblage of anchors, chains, and bridles laid athwart the bottom of a river or harbour for the purpose. When two anchors are dropped by a ship, the cables of both are, as a rule, afterwards shackled together, and from the point of union a single cable is led in through one hawsehole.

Moose. [ELK.]

Moplah (MAPILLAH), low-caste communities, at Calicut and other districts, especially on the Malabar Coast, India, are generally of a ruddy black colour, with black, wavy hair and of Malayalim (Dravidian) speech; they appear to be half-breeds sprung from Arab immigrants, who intermarried with the Tiyars. The same term (*Moplay*) is applied to the natives of the Laccadive Islands, apparently of mixed Nair and Arab descent—Nairs by tradition, Mohammedans by religion, and of Malayalim speech.

Moqui (MOKI, TUSAYAN), one of the chief branches of the Pueblo Indians [PUEBLO], who founded six *pueblos* (village settlements) east of the Colorado Chiquito, in East Arizona and New Mexico. With this group is connected a seventh *pueblo* inhabited by people of Tañean stock; but the Moqui themselves are members of the great Shoshonean (Snake) family. They number collectively about 1,900, all still occupying their original *pueblos*.

Morabits, or ALMORAVIDES, a dynasty of Moors who flourished in the eleventh century, and who were overthrown by the Almshades.

Moraines are masses of *débris* found on glaciers. Stones and rocks are constantly falling from the sides of the mountains on to the glacier, and form a fringe of rubbish all along the edge of the ice. These fringes are the *lateral moraines*. When two glaciers meet, the adjoining lateral moraines of each unite to form one; and, as the double glacier moves slowly on its downward path, the mass of *débris* is carried with it, so that a central line of stones, etc., or a *medial moraine*

extends to the end of this ice river. As the stones come to the glacier's mouth, the ice melts from under them, and they are left to form constantly-increasing heaps and ridges, known as *terminal moraines*.

Moravia (MÄHREN), a province of Austria-Hungary, is situated between Bohemia and Hungary, having Silesia on the N. and Lower Austria on the S. It has an area of 8,579 square miles. The Slavonian inhabitants were subjected by Charlemagne, and Christianity was introduced in the 9th century. In the 11th century Moravia formed one territory with Bohemia, which its duke had conquered. After the battle of Mohacz (1526) it came into the possession of the house of Austria; but it was not until 1849 that it became a separate province. Moravia is surrounded by mountains, and is well watered by numerous streams. From its fertile soil good crops of rye and oats, wheat and barley, and several fruits are produced; and there is also some excellent pasture, on which good breeds of cattle are reared. Coal and iron are found, and several manufactures flourish. Slavs form the bulk of the population, and the immense majority of the people are Roman Catholics. Brünn and Olmütz are the chief towns.

Moravians, the United Brethren or *Unitas Fratrum*, said to have been founded by John Huss. They were expelled from Moravia and Bohemia in 1627, and in 1722 a few members settled at Herrnhut, in Saxony, whence the sect spread over Germany, Britain, and America. They accept the Bible as their only authority, and hold that human nature is thoroughly depraved. They are episcopalian, and use a liturgy. They are most noted for their missionary work and for their influence upon Methodism.

Moray, JAMES STEWART, EARL OF, generally known as the REGENT MURRAY, was a natural son of James V. On the return of his half-sister, Mary, from France, he did his best to advise her, but, being a Protestant, strongly opposed the Darnley marriage. After the murder of the king-consort, at which he is said to have "looked through his fingers," he went to France, but on the abdication of Mary was appointed Regent of Scotland. He brought to trial the murderers of Darnley, but headed the army which defeated Mary at Langside after her escape in 1568. On his return to Scotland after the conferences at York and Hampton Court [MARY STEWART], he had to put down a conspiracy of the Hamiltons, who had supported Mary from selfish motives, and to repress the lawlessness of the border. While engaged in his preparations he was assassinated at Linlithgow in 1570.

Morbihan, a French department, formerly part of the province of Brittany, has Finisterre and Côtes du Nord on the N. and W., Ile-et-Vilaine on the E., and Loire-Inférieure on the S.E. It has an area of 2,624 square miles, including the island of Belle Isle. There are several smaller islands. A large part is covered by heath and marsh. The chief towns are Vannes and L'Orient. The name (Breton for *little sea*) is properly that of the inland

archipelago on the W., remarkable alike for the number of its islands and the force of its tides.

Mordants. [DYEING.]

Mordvinians, a branch of the Volga Finns, chiefly west of the Volga between Nijni-Novgorod and the Don Cossack territory; two sections, *Ersia* and *Moksha* (a third, *Karatai*, are dispersed). They were formerly far more numerous and widespread, and in the 10th century Constantine Porphyrogenetus speaks of them as a very powerful nation inhabiting the land of *Mordia* in central Russia; but they were reduced by Ivan the Terrible in the 16th century, and since then many have become Russified. Most of them were pagans till the 18th century, when nearly all became at least nominal Christians ("Orthodox Greeks"), though still practising many heathen rites. Formerly nomads, they are now settled agriculturists, but still speak a Finnish dialect, closely related to the Cheremissian.

More, HANNAH (1745-1833), was born near Bristol, where she taught for some time in a boarding-school kept by her elder sisters. An annuity bestowed upon her by an admirer of her early works enabled her to give herself up to writing. In 1776 she became a friend of Garrick, who in the next year brought out her tragedy *Percy* at Covent Garden. In 1782 she published *Sacred Dramas*, and then retired to a cottage near Bristol, where she continued to write, but also did much good among the people of the neighbourhood. Her most popular works were *Calebs in Search of a Wife* (1809), *Practical Piety* (1811), and *The Shepherd of Salisbury Plain*, a tract. She died at Clifton.

More, HENRY (1614-87), the Cambridge Platonist, a native of Grantham, was educated at Eton and Cambridge, where he became fellow of Christ's College. His best work is *Divine Dialogues* (1668). In his later years he became tinged with mysticism. Collections of his theological and philosophical works appeared respectively in 1675 and 1678.

More, SIR THOMAS (1478(?) - 1535), was brought up in the house of Archbishop Morton (q.v.), who sent him to Oxford. In 1501 he entered Parliament, and soon became prominent for his opposition to the exactions of Henry VII. In 1508 he was made a judge in the sheriff's court and two years later under-sheriff of London. He was introduced to the notice of Henry VIII. by Wolsey, and became very intimate with the king. He was employed in important diplomatic missions in 1514 and 1527, and created a knight and Privy Councillor. As Speaker of the House of Commons he opposed Wolsey's attempts at arbitrary taxation, but nevertheless was appointed to the offices of Master of Requests and Chancellor of the Duchy of Lancaster. In 1529 he became Lord Chancellor, and took an active part in promoting reforms in the Church. Being opposed to a breach with Rome, he was, however, deprived of the seals in 1532, and two years later was sent to the Tower. All devices were tried in vain to make him take the oath acknowledging the king's headship of the Church and he was executed in 1535 on a charge of

misprision of treason. His *Utopia*, in which many social changes were anticipated, was translated from the Latin in 1556. He wrote in English a *History of Richard III.*

Morea, the modern name of the southern half of Greece, anciently called the PELOPONNESOS. Its name is derived by some from the Latin word for mulberry (*morus*), the leaf of which it somewhat resembles in shape; but some modern scholars trace its origin to the Slavonic *more* ("the sea"). The Slav immigrants were subdued by the Eastern Emperors, one of whom, Michael Palæologus VIII., partially recovered it from the Normans, who had held it since 1205. During the Middle Ages the peninsula was the scene of endless strife. Towards the end of the 15th century the Turks acquired the larger portion of it. Venice reconquered it in 1684, but lost it again in 1714; and it remained Turkish till the Greek War of Independence.

Moreau, JEAN VICTOR (1763-1813), was born at Morlaix, Brittany. On the outbreak of the Revolutionary wars he abandoned a legal for a military career, and in 1794 was named general of division. As such he distinguished himself with Pichegru in the conquest of Belgium and Holland, and in 1796 was appointed to succeed to his command on the Moselle and Rhine, when he distinguished himself by his victories over the Austrians, and still more by a masterly retreat across the Rhine. After 18 Fructidor he was deprived of his command; but in 1798, while serving with Schérer in Italy, saved the French from destruction by Suvarof by another masterly retreat. After the death of Joubert at Novi he assumed the chief command; and, on his return to France, was offered by Siéyès the generalship of the insurgent directors. He preferred, however, to assist Bonaparte, who, however (18 Brumaire), gave him the command on the Rhine. By the conduct of the campaign of 1800, when he won the battle of Hohenlinden, he showed himself one of the greatest generals in Europe, but at the same time incurred the jealousy of Bonaparte, who obtained his condemnation and banishment (1804). Moreau remained in America till 1813, when he joined Napoleon's enemies, and was mortally wounded at Dresden.

Morecambe, a seaport and watering-place on Morecambe Bay (q.v.), in N.W. Lancashire. It has a fine stretch of sands (eminently suited for bathing), and is much resorted to by visitors. The Summer Gardens and the People's Palace are places of attraction. The fine pier was re-opened in 1896, having been partly destroyed in 1895. Pop. (1901), 11,798.

Morecambe Bay, on the coast of Lancashire, separates Furness from the main part of the county. It is 18 miles long and about 10 broad. Into it flow the Lune, the Leven, and some smaller streams.

Morelia, a Mexican city, capital of the state of

Michoacan, stands more than 6,000 feet above the level of the sea. Its former name was Valladolid. It has a cathedral and fairly flourishing manufactures. Here were born Morelos and Iturbide.

Morgan, SIR HENRY, a noted buccaneer and adventurer, who was born in Wales in 1632. Having obtained great influence over the pirates in the West Indies, he became their chief, took and plundered the town of Puerto del Principe, forced the entrance to Lake Maracaibo, sacked both Maracaibo and Gibraltar, another town on the lake, and committed unheard-of atrocities. In the meantime a Spanish squadron blocked up the mouth of the lake, but Morgan cleared the channel by means of a fireship, and made his escape. This was in 1669. In 1670-71 he captured Santa Catalina and San Lorenzo, and sacked the rich city of Panama, which he then burnt. In the course of his piratical career he was at least once imprisoned, but he was secretly favoured by Charles II., and was in time knighted and made successively Commissioner of the Admiralty Court and Lieutenant-Governor of Jamaica. He died in 1690.

Morgan (SYDNEY OWENSON), LADY, novelist and memoir-writer, was born, the daughter of an Irish actor, between 1775 and 1780. She came to London to retrieve the family fortunes, and in 1806 made a name by the publication of *The Wild Irish Girl*. Besides several other novels she wrote interesting works on France and Italy and left some lively *Memoirs*, which were edited in 1862 by Hepworth Dixon. In 1812 she married a physician named Morgan, and in 1837 received a Civil List pension of £300. She died in 1859.

Morghen, RAFFAELLE SANZIO (1758-1833), the great engraver, was born at Naples. In 1781 he engraved Raffaele's *Poetry* and *Theology*, and afterwards *The Transfiguration* of the same master, and Leonardo's *Last Supper*, Andrea del Sarto's *Madonna del Suero*, and other famous pictures. He died at Florence, where he had established a school of engraving and had been provided with a pension and free quarters from the Grand Duke. He married a daughter of Volpato, his master at Rome. Morghen's *Life* was written by his pupil, Palmarino; in the book is a catalogue of his works.

Morgue, a dead-house in which bodies of persons found dead are exposed for identification. The best known is that in Paris.

Moriscos, Moors who remained in Spain after their conquest by the Spaniards. The Moriscos were expelled from Spain in 1609.

Morison, JAMES COTTER (1831-88), one of the English Positivists, was educated at Highgate and Oxford. His chief works were *The Life and Times of Saint Bernard* and *The Service of Man*. He also collected materials for a history of the French Revolution, but was prevented by ill-health from undertaking it: and he took a leading part in the foundation of the *Fortnightly Review*.

